

# **Expanding Access to Natural History Images: the Biodiversity Heritage Library and its Global Consortium**

Trish Rose-Sandler

Aug 15 2016 | IFLA session

*Worth a Thousand Words: A Global Perspective on  
Image Description, Discovery, and Access*



# Inspiring Discovery through Free Access to Biodiversity Knowledge

## *Vision*

## *Mission*

The Biodiversity Heritage Library improves research methodology by collaboratively making biodiversity literature openly available to the world as part of a global biodiversity community.

# BHL Global Partners

Europe

China

Australia

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Brazil

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Singapore





# Workflow

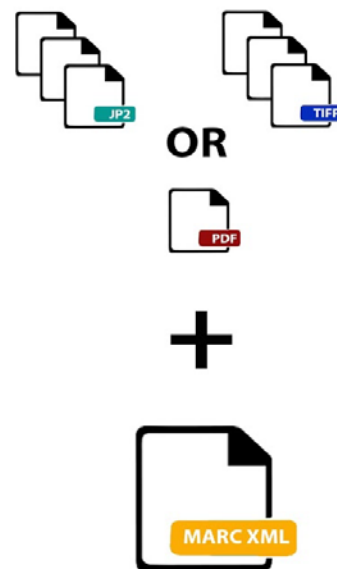
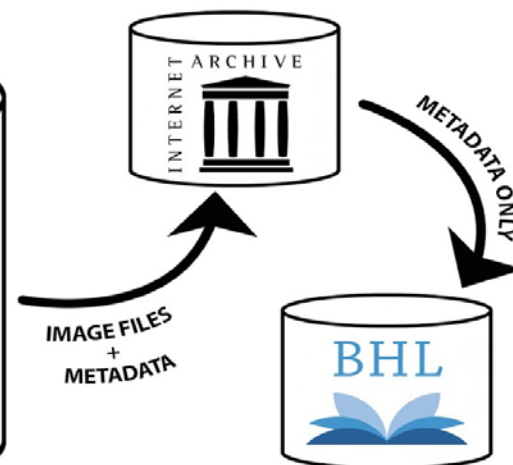
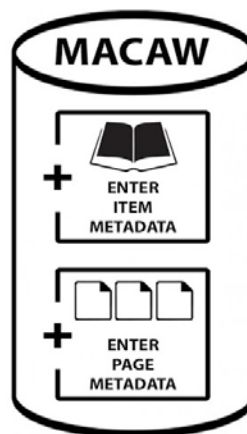


IMAGE FILES  
TITLE  
METADATA



# Standards used



- MARC
- TIFFs, JP2s, PDFs



# BHL Portal

 [www.biodiversitylibrary.org](http://www.biodiversitylibrary.org)



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*Inspiring discovery through free access to biodiversity knowledge.*

The Biodiversity Heritage Library works collaboratively to make biodiversity literature openly available to the world as part of a global biodiversity community.

BHL also serves as the foundational literature component of the Encyclopedia of Life (EOL).



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### New on the BHL Blog

#### Alexander Wilson and the Catbird

A tiny corner of green in a bustling city landscape, the cemetery of Philadelphia's Gloria Dei...

#### BHL's Venture into New Territory

We really love trying new things and using new tools to help provide more access to the literature...

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### Featured Collection Savants of Napoleon's Egyptian Campaign



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Voles (Microtinae) / I.M. Gromov and I.Ya. Polyakov ; scientific editors, Dougl...

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URL for Current Page

<http://biodiversitylibrary.org/page/32105340>

Scientific Names on this Page

- Page 196 (Text)
- [Alticola](#)
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- [Platycranius](#)
- [Pliomys](#)

Indexed by Global Names

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even down to sea level. Species are found in mountain ranges in eastern Eurasia: ranges in Pamir, Altai, Tien-Shan, southern Siberia and Mongolia, Central Asia and eastern and northeastern Siberia, where by way of rocky regions and gravel terraces of rivers they reach the ocean.

*Evolution and phylogeny:* Fossil remains are known from the early Middle Pleistocene (foothills of Zeravshan range, Trans-Baikal region?). The report of *Alticola* in the Middle Pleistocene fauna of Choukoudyanya I. (north of Beijing) (Young, 1934) is not reliable. What probably was described were the remains of a juvenile *Clethrionomys rufocanus* before the formation of molars. Animals lacking a complicated paraconid section of M<sup>1</sup> (the *episcopalis* group), which is similar to the early sparsely-cemented members of *Clethrionomys*, indicates a probable affinity with *Pliomys* spp. The transitional characters linking *Alticola* with forest voles are particularly distinct in species of the subgenus *Aschizomys* which, probably, should be considered a *Clethrionomys* that has lost its [molar] roots as in the genus *Antelionys*.

KEY TO SUBGENERA OF SPECIES OF GENUS *ALTICOLA*

- (2). Height of skull at anterior margin of alveolus of M<sup>1</sup> notably smaller than length of upper molar row. M<sup>2</sup> longer than M<sup>1</sup> ..... Subgenus *Platycranius* Kastschenko (p. 201).  
One species: *A. (P.) strelzovi* Kastschenko.
- (1). Height of skull at anterior margin of alveolus of M<sup>1</sup> equal to, or greater than length of upper molar row. M<sup>2</sup> not longer than M<sup>1</sup>.
- (4). Enamel coat of molars thick; apices of triangles of masticatory surface rounded. Anterior unpaired loop of M<sup>3</sup> isolated from rest of tooth ..... Subgenus *Aschizomys* Miller (p. 202).  
One species: *A. (A.) macrotis* Radde.
- (3). Enamel coat of molars thin; apices of triangles of masticatory surface acute. Anterior unpaired loop of M<sup>3</sup> fused with rest of tooth ..... Subgenus *Alticola* Blanford (p. 197).
- (6). Brownish tones dominant in long silky dorsal pelage. Tail light-colored, monochromatic; length half or more trunk length ..... *A. (A.) argentatus* Severtzov.
- (5). Brownish-ash tones dominant in comparatively short, stiff

Subgenus *Alticola* Blanford, 1881

*Diagnosis:* Skull relatively high, its height at anterior margin of alveolus of M<sup>1</sup> equal to, or more than length of upper molar row. Interorbital space and braincase not highly flattened. Enamel thin; apices of triangles of masticatory surface of molars acute, shorter than, or equal to M<sup>1</sup>. M<sup>2</sup> with two lateral folds; difference in depth of folds large. Medial folds of M<sup>2</sup> broader than triangles; anterior unpaired loop usually not isolated from rest of tooth. Number of chromosomes, 2n = 56.

*Composition of subgenus:* Up to 20 species have been described from a single specimen or a small series from inaccessible areas of Central Asian and northern Indian mountains. V.G. Severtzov and O.L. Rossolimo (1968) examined a few of these species and have presented their view regarding the affinities of the subgenus within the genus based on their concept of polytypic species. This view is compared with the findings of Ellerman (1947), who examined all the material from the British museum, and the findings presented in more recent publications, one is compelled to conclude that it is hardly possible to solve the problem of the number of species of this subgenus using the old method of subgenus taxonomy, even through simultaneous examination of the entire material available in collections. At present, in the opinion of Soviet scientists, the following three species (probably subgroups) may be accepted: *A. argentatus* Severtzov, 1879; *A. Gray*, 1842; and *A. stolizkanus* Blanford, 1875 (= *stracheyi* Th 1880). In this context, it should be kept in mind that all three taxonomic characters selected show a distinct clinal variability: length decreases, color becomes gray, and structure of M<sup>3</sup> similar to the south and east.

*Distribution and zonal affinity:* Typical habitats of *Alticola* occupied by the above-named species, up to the upper limit of distribution of the genus in the Pamir-Alai, Tien-Shan, and Sayan ranges, Central Asia and eastern Mongolia up to Bogd (eastern Mongolia), Nan-Shan, the upper reaches of the Ganges River and eastern Nepal. By clinal variability, long-tailed forms mainly occupy the northern and western parts of the range; short-tailed forms the central and southern parts, but they also alternate northeast (Altai) where species from both groups are native. Fossil remains were found in the Pleistocene much

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# Challenges

Millions of natural history illustrations but no way to search for them



About BHL Help



ADVANCED SEARCH

Search

Cassell's book of birds - From the text of Dr. Brehm /

v-4

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Scientific Names on this Page

Page 104, Fig. 40

*Jacana*

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CASSELL'S BOOK OF BIRDS.

the last-mentioned species, and largely distributed throughout the warm and temperate parts of the earth. These birds are characterised by their powerful, compactly-built body, moderately long neck, large head, and short, strong, deep, thick beak, the culmen of which is strongly arched; and in most instances are further distinguished by a naked projection from the beak, which spreads over the forehead. Their legs are strong and of moderate length, and their toes either very long, or provided with broad lateral fingers or lobes. Their wings are short, the third or fourth quill being usually

THE JACANA (*Jacana Jacana*). ONE-HALF NATURAL SIZE.

the longest; the tail is very short, and they are more or less without variety of tint. In their anatomical structure they are very closely related to the *Rollulus*.

All the *Gallinule* are inhabitants of marshy districts, and some of them might even be called water-fowl. They usually prefer sedge lakes, large swampy morasses and brooks, or ponds and rivers well stocked with vegetation, but are without exception restricted to fresh water. They are generally seen swimming about in open spaces. They run with less agility than the Rails, but far surpass them in their powers of swimming and diving. Although these birds are by no means social in disposition, they show a remarkable attachment to any locality of which they have taken possession, keeping others, even of their own species, at a distance, and sometimes exhibit resolute courage in driving away intruders much larger and stronger than themselves. They also attack small birds

HYDROPHASTANUS SINENSIS — CHINESE JACANA

Contributed by Harvard University, MCZ, Ernst Mayr Library



# Why images are important



## Content is cross-disciplinary:

artists, biologists, humanities scholars,  
historians of science, librarians, education and  
outreach.

anyone who uses images in their research and  
teaching.

# Solutions

flickr



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BHL Biodiversity Heritage Library 1,659 Sets March 2011 Member since

PhotoStream Sets Favorites

Atlas der Alpenflora v.4 126 photos	Herrn de la Cèpede's 21 photos	Die pittoresque Käpellen 42 photos	Osterreichs allgemeine 60 photos	Amstoria of Palet birds v.7 42 photos	Flora médicale des 72 photos	Herrn de la Cèpede's 48 photos	Nouveau recueil de planches 111 photos
La Belgique horticole 69 photos	The zoology of the Voyage 97 photos	Faunogomorpho Bakana et 128 photos	Die pittoresque Käpellen 112 photos	Die Schmetterlinge in 95 photos	Ageneral history of birds v.4 20 photos	Illustrerte Garten- zeiung 11 photos	The animal kingdom 120 photos
Ferns British and exotic v.3 50 photos	American spiders and their 61 photos	Atlas der Alpenflora v.3 126 photos	Dictionnaire pittoresque 66 photos	Conchologia iconica or 129 photos	The American flora v.3 48 photos	Histoire naturelle des 48 photos	Bibliothèque 14 photos
Bibliothèque 34 photos	Les liliacées v.2 120 photos	Flycatchers by W Swainson 31 photos	The flora sylvatica for 127 photos	Exotic conchology or 48 photos	Zoological illustrations v.3 45 photos	Atlas de poche des oiseaux 83 photos	Atlas der Alpenflora v.2 126 photos



# Solutions

## Art of Life project



- Full title - *The Art of Life: Data Mining and Crowdsourcing the Identification and Description of Natural History Illustrations from the Biodiversity Heritage Library (BHL)*
- Grant given to Missouri Botanical Garden in St Louis
- Funded by National Endowment for the Humanities
- May 2012-April 2014

# Solutions

## Art of Life project

### *Objectives*

1. Define an appropriate metadata schema for natural history illustrations
2. Build software tools to automatically identify pages with illustrations in the BHL
3. Classify the illustrations
4. Develop a platform for users to add metadata about the illustrations
5. Preserve the metadata in the BHL architecture





# Solutions

## Art of Life project



Title Stictospiza formosa

Type Paintings

Date *Publication: 1898*

Agent *Author: Arthur G. Butler (1844-1925)*  
*Illustrator: F.W. Frohawk (1861-1946)*

Description A pair of finches with green and yellow bodies resting on reeds

Subjects Birds, finches

*Scientific name: Amandava formosa*  
*Vernacular Name: Green Avadavat or Green Munia*  
*Accepted Name: Amandava formosa (Latham, 1790)*

Inscriptions *bottom center: Green Amaduvade Waxbill (Stictospiza formosa)*

Source Butler, Arthur Gardiner. Foreign finches in captivity. Hull and London: Brumby and Clarke, limited, 1889 (2nd edition). This image comes from the [Biodiversity Heritage Library](https://www.biodiversitylibrary.org/page/17195895), and is available online at [biodiversitylibrary.org/page/17195895](https://www.biodiversitylibrary.org/page/17195895)

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# Solutions

## Art of Life project Algorithm Analysis Tool

Picture blocks  
Contrast  
Color  
Compression

87% effective  
88% effective  
ineffective  
ineffective

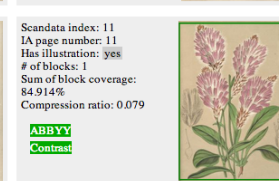
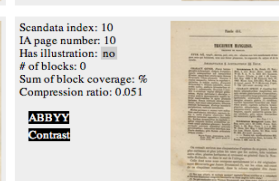
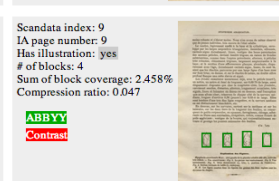
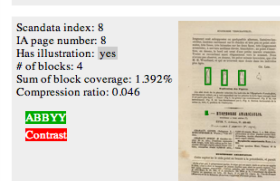
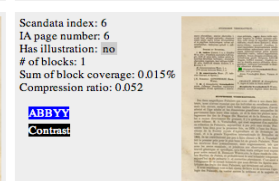
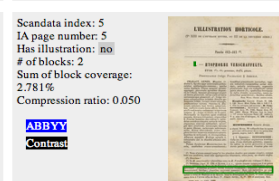
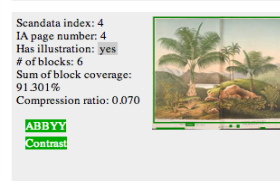
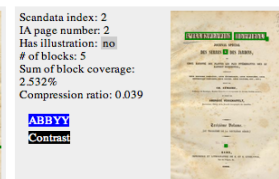
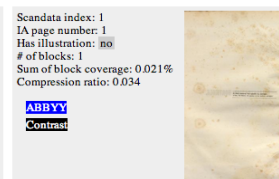
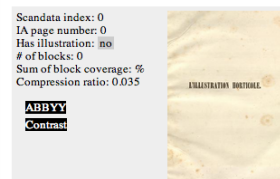
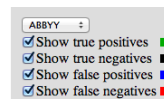
### Page data for mobot31753002364039

Number of pages: 235

Actual # of illustrations: 42

### Algorithm results:

- ABBYY: 85 positives, P = 0.494117647059, R = 1.0
- Contrast: 58 positives, P = 0.689655172414, R = 0.952380952381





# Solutions

## Art of Life project *Macaw classifying tool*



Macaw Metadata Collection and Workflow System System Administrator | Logout | Help | Enter Item ID

Dashboard   In Progress   Create New   Current Item   Admin

J.G. Harrison & Sons nurseries : / 1904

Select:  All  None  Alternate  Inverse

**Metadata [Multiple Pages Selected]**

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# Solutions



## Art of Life project

*Science Gossip* site

<https://www.sciencegossip.org>



## SCIENCE GOSSIP

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roseanna  
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## Uncover the history of citizen science

In the Victorian period, just like today, scientists and members of the public worked together to further scientific discovery. Before computers and cameras they had to draw what they saw. Their drawings are locked away in the pages of Victorian periodicals, such as *Science Gossip*, *Recreative Science* and *The Intellectual Observer*. Help us to classify their drawings and map the origins of citizen science.

145445 PAGES COMPLETED

Get started!

8725 VOLUNTEERS PARTICIPATING



# Solutions

## Art of Life project

Science Gossip User Interface



428 PROCEEDINGS OF THE GEOLOGICAL SOCIETY. [June 7,

*d* 7. The specimen so marked is a portion of the so-called 'dirt-bed,' from the Purbecks at Durdlestone Bay, having imbedded in it the right ramus of the lower jaw of the *Spalacotherium*, wanting the ascending branch, but containing one incisor, a canine or canine-shaped premolar, and ten succeeding molar teeth. It is represented of the natural size in outline, and magnified in tint, in fig. 10.

Fig. 10.—Right ramus of the lower jaw, with teeth, of the SPALACOTHERIUM TRICUSPIDENS, Owen. (Nat. size, and magnified.)

*a.* Oblique view of the molar tooth No. 8. *b.* Crown of the same, seen from above. *c.* Lanianiform tooth (=first premolar?). *i.* Incisor.

The incisor, *i*, is the smallest of these teeth, and has a subquadrate or very obtusely-conical crown, convex externally. The canine or canine-shaped premolar, *c*, is more than twice as long and broad as the incisor, with a subcompressed, sharp-pointed conical crown, a little inclined backwards; it appears to have been inserted by a divided root, like the similarly-shaped and proportioned first premolar in the Mole. The two succeeding teeth, 1 & 2, are one-third smaller than the canine, with subcompressed, conical crowns, at the fore and back part of which the base is slightly produced: each is implanted by two distinct fangs. The third and fourth teeth have a similar form and complex implantation, but are somewhat larger, and the basal cusps are more developed: in the fourth tooth this development gives a distinctly tricuspid character to the crown, the middle cusp, representing the crown of the preceding teeth, being the largest and highest. The six following teeth, 5 to 10, repeat the same unequal tricuspid form, with increased but varying size; the middle teeth, 6, 7, 8, being the largest, and the last tooth, 10, diminishing in size in a greater ratio than the penultimate one, 9.

Species

Common Name

Scientific Name

Spalacotherium tricuspidens

OK

BACK

Mark any species, inscriptions and contributors in the illustrations.

Species

Inscription

Contributor

CONTINUE

# How to gauge success

## Stats

- Flickr – 27,000 images tagged (since 2011)
- Science Gossip- 145k pages with images described by over 8700 volunteers (since 2015)





# How to gauge success

## User Engagement

Nearly 13,000 comments by 650 users on TALK pages



Talk Science Gossip

Following Recent Discussion boards Search Profile

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#### How to describe figures 41,42,43?

Started 2 months ago by Redtail9898

Wondering what the tags should be for diagrams like 41-43, the tutorial and FAQ didn't have anything for something like this.

Posted 2 months ago

by Jules MODERATOR

It's not obvious at first what's going on here so I would look for clues in the text and for figs 41, 42 and 43 would use keywords such as *geology*, *fossil flints*, *flint implements*, *creating flint knives*.

Posted 2 months ago

by trosandler RESEARCHER

Redtail9898 these types of illustrations are not species and therefore not typical of stuff we find in Science Gossip which is why we don't have examples of them. Jules instructions for keywords should be followed.

Posted 2 months ago

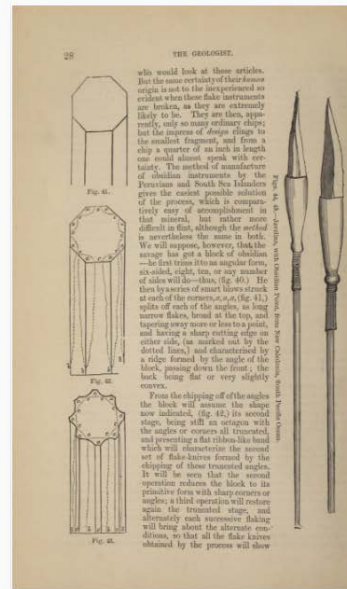
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# How to gauge success

## Coverage by media outlets

*In first year covered by 14 media outlets including :*

- Scientific American
- Popular Science
- Nature Conservancy
- Library Journal





# How to gauge success



## Reaching new audiences

Glass sculptor, Emily Williams, finds inspiration for her work in BHL images

*"The Biodiversity Heritage Library is an amazing resource for visual artists," lauds Emily. "Any artist interested in learning about natural history and science would consider these rare resources invaluable."*



# How to gauge success

## Feedback on social media

BHL is now seen not just primarily as a text resource but as a significant image resource as well



Gordon Ober @oberrated - 22 Jul 2014

@BioDivLibrary has an incredible collection of classic biological illustrations, check it out:  
[flickr.com/photos/biodivl...](https://www.flickr.com/photos/biodivl...)



Christina M. Colvin @christeena\_C - 25 Oct 2013

@BioDivLibrary's Flickr: super place to see organisms you didn't know existed & to imagine those yet to be discovered [biodiversitylibrary.org](http://biodiversitylibrary.org)



Tim Astrop @Theironlobster - 15 Apr 2014

My Jaw literally dropped when I saw this collection of beautiful images on @BioDivLibrary 's flickr [flickr.com/search?user\\_id...](https://www.flickr.com/search?user_id...) #palaeontology

