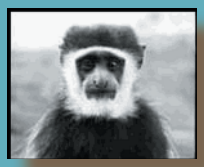
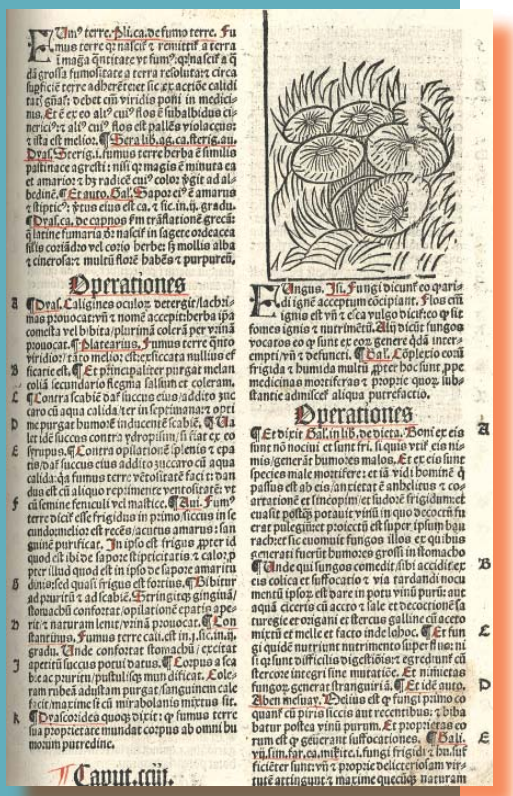




The Biodiversity Heritage Library Project

Representatives of a number of major natural history and botanical libraries met at the Smithsonian National Museum of Natural History in Washington, D.C., with the support of the Smithsonian Institution, to develop a strategy and operational plan to digitize the published literature of biodiversity held in their respective collections and to make that literature available for open access and responsible use as a part of a global "biodiversity commons."

Participating libraries:

- American Museum of Natural History
- Harvard University Botany Libraries
- Harvard University, Ernst Mayr Library of the Museum of Comparative Zoology
- Missouri Botanical Garden
- Natural History Museum, London
- The New York Botanical Garden
- Royal Botanic Gardens, Kew
- Smithsonian Institution

The participating libraries have over two million volumes of biodiversity literature that they have been collecting for over 200 years to support scientists and students throughout the world.

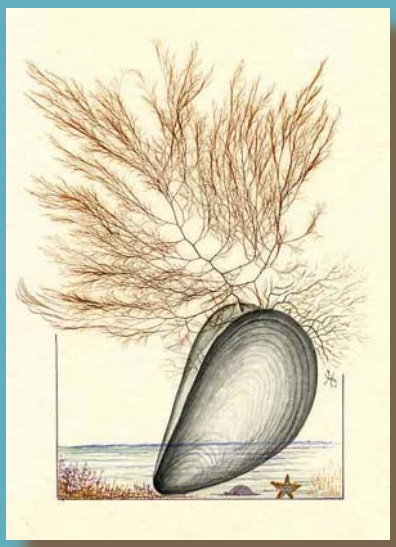
Situation Analysis: The eight partner libraries collectively hold a substantial part of the world's published knowledge on biological diversity. Yet, this wealth of knowledge is available only to those few who can gain direct access to these collections. This body of biodiversity knowledge is thus effectively withheld from wide use for a broad range of applications including: research, education, taxonomic study, biodiversity conservation, protected area management, disease control, and maintenance of diverse ecosystems services. Much of this published literature is rare or has limited global distribution and is available in only a few select libraries. From a scholarly perspective, these collections are of exceptional value because the domain of systematic biology depends -- more than any other science -- upon historic literature. The "cited half-life" of natural history literature is longer than that of any other scientific domain and the "decay-rate" of this literature is much slower than in other fields (cf. biotechnology). Mass digitization projects at large research libraries lacking the discipline-specific focus of these partner institutions may fail to capture significant elements of this

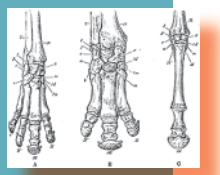
biodiversity legacy.

Plan: The May 2005 planning workshop established a consensus to seek support from appropriate funding agencies to implement as soon as possible the Biodiversity Heritage Library (BHL). The planning workshop resulted in a vision to establish a major corpus of digitized publications on the Web drawn from the historical biodiversity literature in our collections. This material will be available for open access and responsible use as a part of a global Biodiversity Commons. We will work with the global taxonomic community, rights holders and other interested parties to ensure that this biodiversity heritage is available to all. The details of the plan are being refined and further specified. This process of further specification will include discussions with the scientific, biological, and computer science communities.

The plan consists of the following components (not necessarily in sequential order):

1. Develop and refine a business plan to assure long-term maintenance and sustainability.
2. Combine our existing bibliographic holdings for biodiversity publications in a combined "union catalog" database, perhaps done in collaboration with an existing bibliographic utility such as OCLC or RLG or with a non-profit third party such as the Internet Archive.
3. Create a website to host the union catalog and to manage and provide access to the digitized content.
4. Identify materials to be scanned in total. Do segmentation analysis identifying logically and operationally elements of each partner collection to be scanned. Specify the order in which materials will be scanned.
5. Work with the Internet Archive, or another partner with demonstrated technical qualifications for mass scanning and long-term digital content management, to establish three or more scanning centers. Scanning centers will be located in facilities capable of adequately housing the full scanning units and required staff, of providing environmentally sound conditions and security, and of providing logistical access to the materials in the scanning process. Preliminary consideration has been given to the use of existing "remote storage facilities" in the regions near the partner libraries. A scanning center will consist of approximately 10 high-speed state-of-the-art digital book scanners, with staff for two shifts daily, and able to handle approximately 400 volumes per scanning center daily. The technical scanning partner will perform imaging, OCR, association of standard metadata (derived from MARC records provided by union catalog) with the digitized files, file arrangement, security, maintenance of optimal book conservation practices and delivery of the completed scans in conformance with agreed project standards. Article level access to journals will be provided.

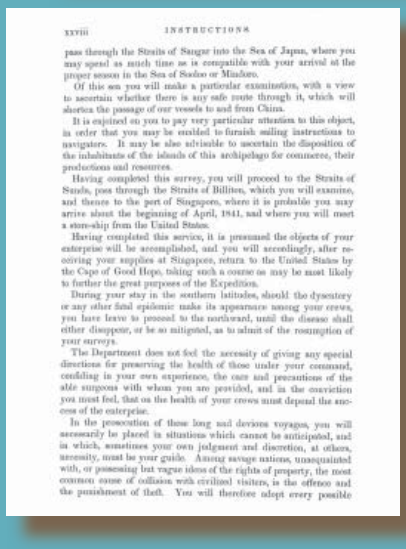




6. Provide "article-level" analysis of serials, which may require some adaptation of existing bibliographic indices of biodiversity literature. This development may be combined with the creation of the "union catalog" mentioned above to provide "one-stop" access to the literature.
7. Apply current best practice for book conservation throughout the project.
8. Evaluate and identifying rights assigned to the digitized publications in accordance with current national and international rights regimes. A record of these rights will be associated with each digitized publication. In the spirit of open access and responsible use, the libraries will seek to negotiate with relevant publishers, especially those with clear missions to disseminate biodiversity information for the public good - learned societies, museums, botanical gardens and herbaria - for permission to digitize and provide access to publications still protected by copyright. Contributing libraries may manage and repurpose as much of the content as they wish with the understanding that all currently public domain material will remain in the public domain and will be made available gratis in an open access mode.
9. Work with other qualified partners, a subsequent stage of the project will explore best available methods of precision clean-up of the OCR text and the development of value added services for searching the BHL collection, such as ability to search using expanded biological names or digital gazetteers. Every effort will be made to assure that the BHL content can interoperate with other major bioinformatics systems.
10. Maintain sustained, persistent access to the BHL using best available technology for preservation of digital files.

A plan for extending collaboration from the original core group of institutions to include other natural history and botanical libraries will be pursued as a secondary step in the project evolution; of particular interest will be international high caliber collections in languages other than English.

Partnership: The Biodiversity Heritage Library must be a multi-institutional project because no single natural history museum or botanical garden library holds the complete corpus of legacy literature even within the individual sub-domains of taxonomy. However, taken together, the proposed consortium of collections represents a uniquely comprehensive assemblage of literature. If individual libraries were to attempt bulk digitization projects individually, there would be a risk of a lack of standardization, loss of intellectual integrity, likely duplication and the loss of economies of scale. In addition, we believe a powerful partnership should be far more appealing to funders, and provide a trusted grouping to negotiate with copyright owners. A set of clearly defined working relationships will be established as part of the project. User input to the process will be solicited regularly.



XXVIII INSTRUCTIONS

pass through the Straits of Sangar into the Sea of Japan, where you may spend as much time as is compatible with your arrival at the proper season in the Sea of Sachoo or Manchoo.

Of this sea you will make a particular examination, with a view to ascertain whether there is any safe route through it, which will shorten the passage of our vessels to and from China.

It is enjoined on you to pay very particular attention to this object, in order that you may be enabled to furnish sailing instructions to navigators. It may be also advisable to ascertain the disposition of the inhabitants of the islands of this archipelago for commerce, their productions and resources.

Having completed this survey, you will proceed to the Straits of Sunda, pass through the Straits of Billiton, which you will examine, and thence to the port of Singapore, where it is probable you may arrive about the beginning of April, 1841, and where you will meet a store-ship from the United States.

Having completed this service, it is presumed the objects of your enterprise will be accomplished, and you will accordingly, after receiving your supplies at Singapore, return to the United States by the Cape of Good Hope, taking such a course as may be most likely to further the great purposes of the Expedition.

During your stay in the southern latitudes, should the dysentery or any other fatal epidemic make its appearance among your crews, you have leave to proceed to the northward, until the disease shall either disappear, or be so mitigated, as to admit of the resumption of your surveys.

The Department does not feel the necessity of giving any special directions for preserving the health of those under your command, confiding in your own experience, the care and precautions of the able surgeons with whom you are provided, and in the conviction you must feel, that on the health of your crews must depend the success of the enterprise.

In the prosecution of these long and devious voyages, you will necessarily be placed in situations which cannot be anticipated, and in which, sometimes your own judgment and discretion, at others, necessity, must be your guide. Among savage nations, unacquainted with, or possessing but vague ideas of the rights of property, the most common cause of collision with civilized visitors, is the offence and the punishment of theft. You will therefore adopt every possible

The BHL will provide basic, important content for immediate research and for multiple bioinformatics initiatives. For the first time in history, the core of our natural history and herbaria library collections will be available to a truly global audience. Web-based access to these collections will provide a substantial benefit to people living and working in the developing world -- whether scientists or policymakers. However, this project is a bounded project. The BHL does not attempt to solve the complex problems related to prospective publications from natural history institutions and the larger universe of problems related to scholarly communication. It does not attempt to address many important issues of the interoperability of many bioinformatics systems, databases, etc. While it will address issues of standardization of data across the initial contributing institutions, it does not presume to address questions of the most effective method of coding of biological information. It is also, at least initially, bounded by the number of institutions involved. While the long-term vision for the project will provide for adding additional libraries, the costs in complexity of including more libraries at this initial stage of development would be counter productive in achieving timely and substantive results.

This project is achievable with current and emergent technology - hardware, software, and standards - and builds on demonstrated proofs of concepts.

July 25, 2005