

# The Linnaeus Link Project

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## Abstract

The Linnaeus Link Project is an international collaboration between libraries with significant holdings of Linnaean material providing free access to an online Union Catalogue of Linnaean publications. It is an information portal for those seeking primary sources for the identification of plants and animals which still relies on the use of Latin genus and species names for internationally recognised identification tags. Examples of their importance can be seen in the need to identify invasive species or biological control agents. Nomenclature has its starting points in the publications of Carl Linnaeus, with the texts of the *Species Plantarum* of 1753 and *Systema Naturae* of 1758 providing a base line for plant and animal names. Access to such early texts is inevitably restricted with existing copies often not fully catalogued due to the bibliographic complexities of these works. This project provides information on location of copies, good bibliographic sources and also identifies publications now available in digital form. The project has been in existence for 10 years and the Linnaeus Link Union Catalogue is now available online with 1,680 separate bibliographic records. Information on sources of Linnaean publications is now being harvested from The Linnean Society of London, The Natural History Museum, Royal Library: National Library and Copenhagen University Library, Uppsala University Library, Botanic Garden and Botanic Museum Berlin-Dahlem and The British Library, with expected input shortly from the New York Botanic Garden and the Conservatoire et Jardin Botaniques de la Ville de Genève and other libraries in the UK and USA. Planned enhancements of the catalogue software will facilitate both searching and the harvesting of records and link direct to digital copies. Links to the Biodiversity Heritage Library and other on-line resources will help to speed access to key texts and support the needs of taxonomists serving all life sciences.

## Background to the Linnaeus Link project

Carl Linnaeus is one of the great scientific figures of the 18th century. His works and those influenced by him are of great historical significance and continuing scientific relevance. The Linnaeus Link project was inaugurated in 1999 and aims to improve access to these key resources by the creation of high quality digital records.

Preparations for the celebration of the 2007 tercentenary of his birth included providing access to over 4000 letters exchanged between Linnaeus and his correspondents in 18th century academic and scientific circles both in Sweden and internationally. The publications of Linnaeus and his 331 pupils feature frequently in these and availability of online links to good citations were needed.

Others working in institutions engaged in the study and documentation of biodiversity also needed access to these primary sources, the published work of Linnaeus being still the starting point for the scientific naming of plants and animals. These include the major cereal crops, such as wheat, *Triticum*, barley *Hordeum*, oats, *Avena*, rice, *Oryza* and maize, *Mais* as well as most other major fruit and vegetable crops, such as tomatoes and potatoes in the genus *Solanum*. Forest and timber trees also have Linnaeus's names. In all of these, access to copies of Linnaeus's publications, information as to their availability and accurate bibliographic information are essential tools.

The identification and correct naming of plants and animals underwrites all investigations into biodiversity. Nomenclature has its starting point in the publications of Linnaeus and the *Species Plantarum* of 1753 and *Systema Naturae* of 1758 provide a base line for taxonomy. At the time the

Linnaeus Link Project was initiated the only access to these was limited to copies held in major national institutional libraries but often not fully catalogued, in rare book collections and some out of print facsimile editions or microfiche. Access to these publications by those working in biological, agro-forestry and related sciences can be both restricted and difficult.

### First steps to a union catalogue of Linnaean publications

In 1999 on-line library catalogues were beginning to be available but the complexity of Linnaeus's publications meant that most natural history libraries had left these until last, each hoping that another institution was going to provide good catalogue records! The major published available sources were the *A catalogue of the works of Linnaeus ... preserved in the libraries of the British Museum (Bloomsbury) and the British Museum (Natural History) (South Kensington) [now the British Library and The Natural History Museum]*, second edition, 1933 by Basil H Soulsby, (see fig.1) and *An index to the authors (other than Linnaeus) mentioned in the Catalogue of the works of Linnaeus preserved in the libraries of the British Museum*, second edition, 1933 (1936) by C Davies Sherborn.

Following creation of the initial partnership in 1999 between the Linnean Society of London, the Natural History Museum Library and the British Library in the UK, libraries in Uppsala and Stockholm in Sweden and the Hunt Institute for Botanical Documentation in Pittsburgh, a scanned version of the Soulsby catalogue was made available through the Linnaeus Link's initial web site, hosted by the Natural History Museum. This made good citations available through the web, although it was rapidly realised that there were confusing cross-references in Soulsby, as well as omissions and inconsistencies.

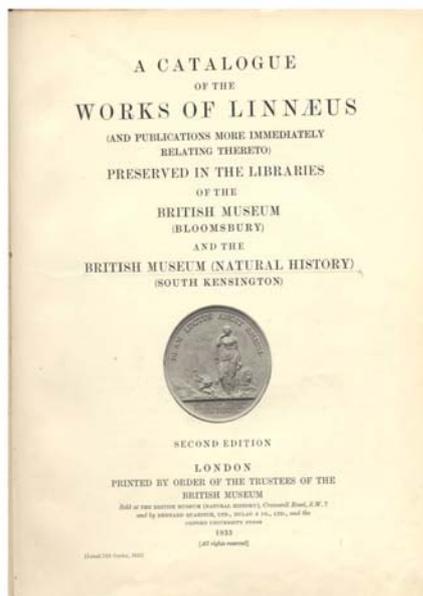


Fig.1 The main source of Linnaean citations compiled by Basil Soulsby

The initial phase of the project focused on defining the limits of what needed to be done, writing a project proposal and seeking funding. The Partners met at regular intervals but progress was slow. It was agreed that we needed to create a comprehensive catalogue of the publications by Carl Linnaeus and his students published prior to 1831 and which reflecting the Linnaean holdings of major research collections worldwide. To find out where these were, one of the founding partners, the Hunt Institute, agreed to take on the survey task and survey forms were sent out to 450 institutions (see Fig 2). At the last count 88 surveys had been returned. Survey questionnaires are now available in English, French, German, Spanish and Russian, with an Italian version in preparation.

For purposes of this survey, Linnaean works can be said to include published or unpublished collection materials which cover "the scientific and other writings of Linnaeus, his editorial activities, travels, the theses and orations in which he was more or less concerned, letters, life, portraits, herbarium and collections, lectures, his family, and even the societies, periodicals and places named after him" [Review of the Catalogue of the works of Linnaeus, 2nd ed. 1933], in: *Nature* (London); Dec.16, 1933, p.911-912.

**The rest of the message is the full survey questionnaire, for use if you have Linnaean materials:**

- Section 1: Description of Linnaean collections (1a-1j)
- Section 2: Description of Linnaean materials (2a-2g)
- Section 3: Inventories and catalogue records (3a-3j)
- Section 4: Access to catalogue records of Linnaean collections (4a-4d)
- Section 5: Additional information (5a-5c)

Fig. 2 Sample of survey form defining limits of survey and sections within it.

**Core catalogue building and software creation:**

In 2004 the Linnean Society of London agreed to fund a three-year post to catalogue the extensive Linnaean collections in the Natural History Museum as well as the IT development of the union catalogue, with the Museum providing staff support and facilities from January 2004. The Natural History Museum's Linnaean Collection forms the core of the union catalogue. The cataloguing is done to international rare book cataloguing standards (*Descriptive Cataloguing of Rare Materials*) and the guidelines for cataloguing are shown in this extract from them (see Fig 3)

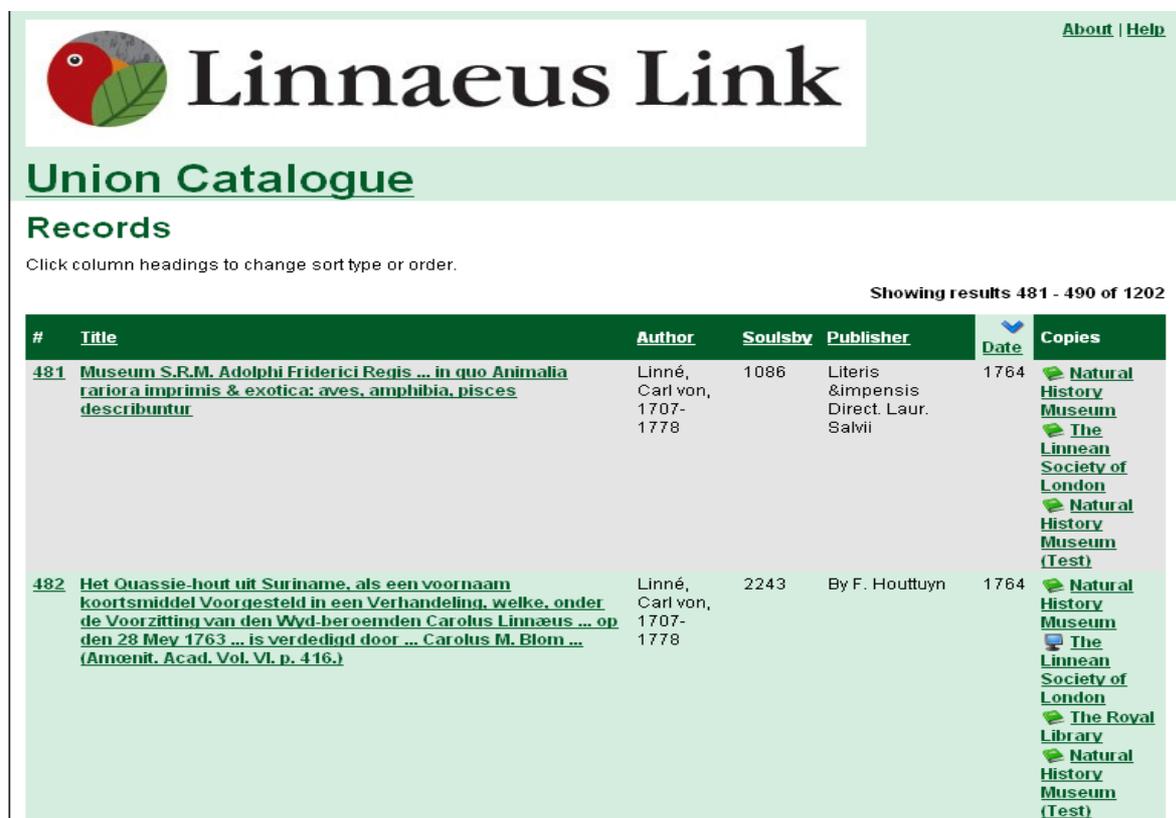
**LINNAEUS LINK CATALOGUING GUIDELINES**

The core cataloguing for the project at NHM uses MARC21 and follows the guidelines laid down by the *Descriptive Cataloguing of Rare Books, (DCRB) 2<sup>nd</sup> ed.* prepared by a Working Group under the auspices of Office for Descriptive Cataloguing Policy, Library of Congress and Bibliographic Standards Committee of the Rare Books and Manuscripts Section, Association of College and Research Libraries, American Library Association. (Washington: Library of Congress, 1991). In turn, these guidelines follow rules formulated under *AACR 2* (Ottawa: Canadian Library Association; London: Library Association; Chicago: American Library Association, 1988), and *ISBD (A): International Standard Bibliographic Description for Older Monographic Publications (Antiquarian)*, 2<sup>nd</sup> ed. (Munich; London; New York; Paris: Saur, 1991). There are some differences between *AACR2* and *DCRB*, mainly dealing with the method and extent to which bibliographic details in fields 245-4XX are recorded. Where any gaps exist in *DCRB*, advice will be sought from *Guidelines for the Cataloguing of Rare Books* (London: Library Association Rare Books Group, 1997). This has been written for use with the UKMARC format, but can be adapted for use with other formats.

The following checklist describes the MARC21 fields used for the project with brief guidelines regarding use and forms of words. For most notes use ESTC (English Short Title Catalogue) wording if possible, unless a different form of words is suggested in the guidelines below. A blank template is also included at the end.

Fig. 3 Guidelines for cataloguing Linnaean publications

While cataloguing was progressing, systems analysis and software specifications were produced under contract at the NHM. The second half of the project was put out to tender resulting in a contract with Tessella in 2006 to write the software. This is a hybrid catalogue, using Z39.50 technology to harvest records from local sources. Initially based at the Natural History Museum this is now hosted by the Linnean Society through a contract with the University of London Computer Centre. Harvesting began in 2007 and the [Linnaeus Link Union Catalogue](#) is now available online. There are now 1,680 separate bibliographic records on the system. Harvesting gives results from Linnaean records in libraries at [The Linnean Society of London](#), [The Natural History Museum](#), [Royal Library: National Library and Copenhagen University Library](#), [Uppsala University Library](#), [Botanic Garden and Botanic Museum Berlin-Dahlem](#) and [The British Library](#). It is possible to [View descriptions](#) of the Linnaean collections held by participating institutions, or [Search for Linnaean material](#) held by participating institutions based on the [Soulsby catalogue](#). The screen shots (Figs. 4 and 5) show sample entries for records and for detailed descriptions.



The screenshot shows the 'Linnaeus Link Union Catalogue' interface. At the top, there is a logo of a red bird and the text 'Linnaeus Link'. Below this is the title 'Union Catalogue' and a section for 'Records'. A note indicates that column headings can be clicked to change sort type or order. The interface shows 'Showing results 481 - 490 of 1202'. A table displays two record entries with columns for '#', 'Title', 'Author', 'Soulsby', 'Publisher', 'Date', and 'Copies'. Each entry includes a list of participating institutions with their logos.

#	Title	Author	Soulsby	Publisher	Date	Copies
481	<a href="#">Museum S.R.M. Adolphi Friderici Regis ... in quo Animalia rariora imprimis &amp; exotica: aves, amphibia, pisces describuntur</a>	Linné, Carl von, 1707-1778	1086	Literis &impensis Direct. Laur. Salvii	1764	<ul style="list-style-type: none"> <li>Natural History Museum</li> <li>The Linnean Society of London</li> <li>Natural History Museum (Test)</li> </ul>
482	<a href="#">Het Ouassie-hout uit Suriname, als een voornaam koortsmiddel Voorgesteld in een Verhandeling, welke, onder de Voorzitting van den Wyd-beroemden Carolus Linnæus ... op den 28 Mey 1763 ... is verdedigd door ... Carolus M. Blom ... (Amoenit. Acad. Vol. VI. p. 416.)</a>	Linné, Carl von, 1707-1778	2243	By F. Houuttuyt	1764	<ul style="list-style-type: none"> <li>Natural History Museum</li> <li>The Linnean Society of London</li> <li>The Royal Library</li> <li>Natural History Museum (Test)</li> </ul>

Fig. 4 Screen shot showing record entry



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# Linnaeus Link

## Union Catalogue

### Full Record

Title Details	
<b>Title:</b>	Caroli Linnaei ... Critica botanica in qua nomina plantarum generica, specifica, & variantia examini subjiuntur, selectiora confirmantur, indigna rejiciuntur; simulque doctrina circa denominationem plantarum traditur. Seu Fundamentorum botanicorum pars IV. Accedit Johannis Browallii de necessitate historiae naturalis discursus; A Generic and Specific Description of British ...
<b>Soulsby No.:</b>	319
<b>Author:</b>	LINNAEUS, Carl
<b>Added Author:</b>	LINNAEUS, Carl
<b>Language:</b>	
<b>Holdings:</b>	 <a href="#">The Linnean Society of London</a>  <a href="#">Uppsala University Library</a>
Edition Details	
<b>Publishing Details:</b>	Apud Conradum Wishoff, London & Lancaster, T. Caslon &c. ()
Related Titles	
<b>Contains:</b>	<a href="#">276</a>
Notes	
Administrative details	
<b>Record contributed by:</b>	The Linnean Society of London
<b>Date created:</b>	2006-12-14

[Project Contact](#) | [Technical Contact](#) | [Copyright](#)

Fig 5. Screen shot showing full record details

## Partners and Harvesting requirements

The current list of partners is:

- [Botanischer Garten und Botanisches Museum Berlin-Dahlem](#)
- [British Library](#) (London)
- [Conservatoire et Jardin Botaniques de la Ville de Genève](#)
- [Hunt Institute for Botanical Documentation \(Pittsburgh, PA\)](#)
- [Det Kongelige Bibliotek, Nationalbibliotek og Københavns universitetsbibliotek](#) [Royal Library: National Library and Copenhagen University Library]
- [Kungl. Vetenskapsakademien](#) [Royal Swedish Academy of Sciences] (Stockholm)
- [Linnean Society of London](#)
- [Natural History Museum](#) (London)

- [New York Botanical Garden](#)
- [Real Jardín Botánico, Madrid](#) [Royal Botanic Garden, Madrid]
- Royal Botanic Gardens, Kew (London)
- [Stockholms universitetsbibliotek](#) [Stockholm University Library]
- [Svenska Linnésällskapet](#) [Swedish Linnaeus Society] (Uppsala)
- [Uppsala universitetsbibliotek](#) [Uppsala University Library]

Annual meetings of the Partners, a list server and a Wiki site keep everyone in contact, assisting communication and helping to resolve problems. One of the on-going tasks is the assignment of “Post-Soulsby” numbers to new publications and this was particularly important recently with many new Linnaean-related publications arising from the celebration of his Tercentenary in 2007. A sample entry in the “Post Soulsby List” for some of these is shown in Table 1. The Linnaeus Link Project Co-ordinator, currently based at the Linnean Society of London, Lynda Brooks, has the task of maintaining and updating this list and making it available to partners and others. The Project has just held its 14<sup>th</sup> meeting hosted by the Hunt Institute in Pittsburgh.

Table 1: extract showing post-Soulsby titles and numbers

Post Soulsby No.	Author	Title	Place	Publisher	Year
4000	Miller, Eric [trans.]	Nemesis divina	Lanham, MA	University Press of America	2002
4001	Jarvis, Chris	The life and times of Carl Linnaeus	Oxford	Oxford University Natural History Museum	[2007]
4002	Jarvis, Charles E.	Order out of chaos	London	The Linnean Society of London with NHM	2007
4003	Svanberg, Ingvar (ed.)	Linneaner: Carl von Linnés lärjungar i Sverige	Stockholm	Wahlström & Widstrand	2006
4004	Hagelin, Ove	Herr archiatern och riddaren Linnaeus I Larda tidningar	Stockholm	Svenska läkaresällskapet : Karolinska Institutet	2007
4005	Nordenstam, Bertil	Linneanska blomster	Stockholm	Carlsson	2007
4006	Hansen, Lars (ed. in chief)	The Linnaeus Apostles: global science and adventure. Vol.1: Introduction	Whitby	IK Foundation Ltd	2007

### *Harvesting requirements*

In order for records from a partner organisation to be included in the harvest process there is a minimum set of cataloguing requirements that need to be undertaken by the contributing librarian, as well as access through Z39.50 protocol:

A Soulsby number needs to be added into the Marc 510 Ref/Citation field.

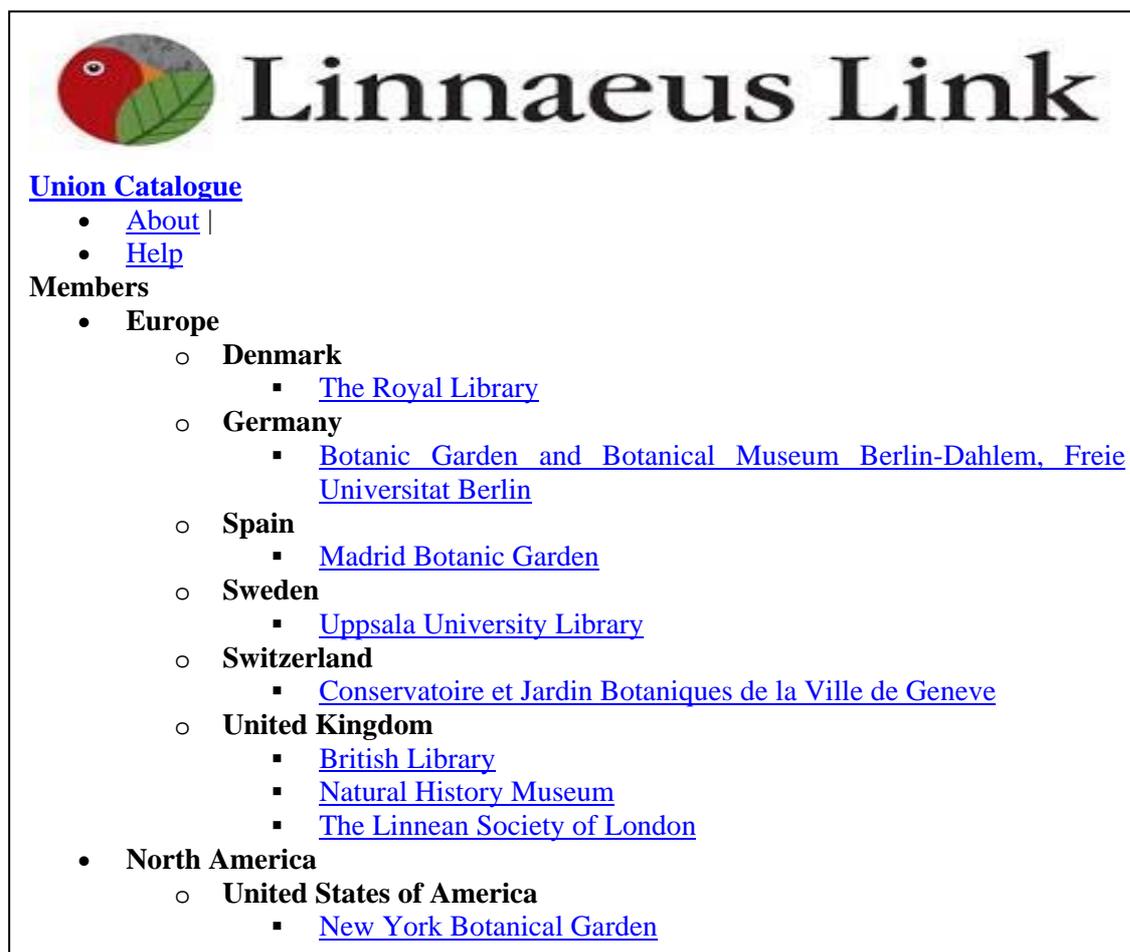
The Publishing Date must be included in the Marc 260c field.

The Title details must be included in the Marc 245 field

The Author or Corporate Author must be included in the Marc 100 or Marc 110 field.

The Language code must be included in either the Marc 041 field or the Marc 008 (position 35-37).

Some of the sites from which records are now being harvested are shown on the following screen dump image, which identifies the current Linnaeus Link partners.  
(Fig.6)



 **Linnaeus Link**

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**Members**

- **Europe**
  - **Denmark**
    - [The Royal Library](#)
  - **Germany**
    - [Botanic Garden and Botanical Museum Berlin-Dahlem, Freie Universitat Berlin](#)
  - **Spain**
    - [Madrid Botanic Garden](#)
  - **Sweden**
    - [Uppsala University Library](#)
  - **Switzerland**
    - [Conservatoire et Jardin Botaniques de la Ville de Geneve](#)
  - **United Kingdom**
    - [British Library](#)
    - [Natural History Museum](#)
    - [The Linnean Society of London](#)
- **North America**
  - **United States of America**
    - [New York Botanical Garden](#)

Fig. 6 Linnaeus Link Partners

## Enhancement and future development

The 14<sup>th</sup> Partners meeting identified a number of areas where improvements could be made. These include direct links to digitally available copies, through the Biodiversity Heritage Library and similar sources, as well as facilities for both downloading records and uploading lists of Linnaean holdings from libraries lacking Z39.50 access. The survey of Linnaean holdings is continuing and new partners are joining the project. The Linnaeus Link is now serving its intended purpose as a portal to Linnaean holdings in major European libraries and harvesting of US Libraries will begin shortly.

Presentations to conferences, including European Botanical and Horticultural Libraries group meetings in Berlin (2000) Brussels (2001), London (2002), Zagreb (2003), Dublin (2004), Vienna (2005), Tallinn (2006) and Madrid (2007) as well as at the Council for Botanical and Horticultural Libraries in Pittsburgh in 2004 and to CILIP and other Library professional groups have all served to promote awareness of the Linnaeus Link Project. There have also been some published papers describing the project. EBHL meetings have been particularly useful in also providing a first hand opportunity to see the extent of Linnaean holdings in hosting institutions, view their accompanying catalogue information and often to recruit new partners.

Our initial vision seemed an impossible dream in the “low technology” days of 1999 when hand written card catalogues were often the only bibliographic source. The ability to respond to enquiries by giving not only web access to good catalogue records, but to their locations and to digital copies has transformed the way information is exchanged. Yet we are still seeking better tools to assist the biodiversity community. Who knows what the next 10 years will bring!

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## References

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DOI 10. 1098/rsnr.2005.0085

UNITED STATES LIBRARY OF CONGRESS, 1991 *Descriptive Cataloguing of Rare Books, (DCRB)* 2<sup>nd</sup> ed. Washington DC USA: Library of Congress, XIII+113 pp.

INTERNATIONAL FEDERATION OF LIBRARY ASSOCIATIONS, 1991, *ISBD (A): International Standard Bibliographic Description for Older Monographic Publications (Antiquarian)*, 2<sup>nd</sup> ed. Munich; London; New York; Paris: Saur.

SHERBORN, C.D. 1936 *An index to the authors (other than Linnaeus) mentioned in the Catalogue of the works of Linnaeus preserved in the libraries of the British Museum*, second edition, London United Kingdom: British Museum, 59 pp.

SOULSBY, B.H., 1933 *A catalogue of the works of Linnaeus ... preserved in the libraries of the British Museum (Bloomsbury) and the British Museum (Natural History) (South Kensington) [now the British Library and The Natural History Museum]*, second edition, London, United Kingdom: British Museum xi+246+(68) pp.