I would like to weigh in on the issue of electronic reference publishing with some thoughts on a unique reference work, the *Encyclopedia of Life Sciences*. What is unusual about this resource is that it is a landmark publishing effort that was initially planned as an electronic product. At the time of commissioning in 1997 the Nature Publishing Group decided that it would publish the *Encyclopedia of Life Sciences* electronically. Editors Gina Fullerlove and Sarah Robertson state that “It was clear that the World Wide Web would play a major role in the dissemination of information and knowledge, and that we should be using it as our primary means of publication.” Only later, due to the advice of librarians and doubts caused by the techno-trama of the dot.com collapse, did a print version evolve. The result is a fully integrated Web resource, as well as a 20-volume print encyclopedia. But it is the Web version that is the flagship product, not the print.

The life sciences sound amorphous and all encompassing, so to give a better sense of the content in this resource, it is worth noting that the *Encyclopedia of Life Sciences* focuses on a number of specific core areas. These areas include biochemistry, cell biology, developmental biology, diversity, ecology, evolution, morphology, genetics and molecular biology, immunology, microbiology and virology, neuroscience, plant science, structural biology, as well as selective coverage of clinical medicine. There is also coverage of related concerns like techniques and methods in the life sciences and the relationship of life science to society. This last topic is reflected in articles on bioethics, the philosophy and history of life sciences and biographies of major scientists and thinkers.

This substantial list of core topics is given definition by over 3,000 articles authored by more than 500 contributors from 43 countries. Specific articles cover topics that range from brown algae to brain evolution, RNA structure to renal failure, eugenics to electron microscopy, classification to cerebral cortex development, alpine ecosystems to adaptive radiation, genome mapping to graft rejection, and neurotransmitters to the neogean time scale.

The *Encyclopedia of Life Sciences* is intended to appeal to both the specialist and the informed non-specialist. In order to reach both audiences more easily, the articles in ELS are classified into types by specificity, and include introductory and secondary articles, as well as special essays. Introductory articles target undergraduates and non-specialists while the secondary articles are aimed at graduate students, researchers and upper division undergraduates. The special essays are not intended for any specific audience but focus on “controversial issues in research or topics that have far reaching impact on society.” In all cases, there is serious scholarship at play throughout ELS. The topics and issues discussed are complex and the treatment sophisticated, and informed by the latest scholarship. Each article has been refereed and the contributors discuss their topics assuming that the reader has some background or basic understanding. Nonetheless, to aid the reader, both the print and electronic versions have a glossary of 4,000 definitions assisting with jargon and technical terms. In addition, the ELS Web version offers searching in three Oxford University Press dictionaries, the *Dictionary of Science*, the *Dictionary of Earth Science* and the *Concise Medical Dictionary*.

The print version of the *Encyclopedia* is thoroughly illustrated with over 6,000 charts, tables, diagrams, drawings and photos. The vast majority of these are black and white, but each volume of the print set has some color plates. The illustrations are also available in the electronic encyclopedia and can be printed, but it is a little tricky. You have to click on a thumbnail and you get an enlarged image, some of which have to maximize before the reader is alerted that he/she has to press “Control P” to print the image. The resulting print quality is good. The images can also be saved and used for other applications like PowerPoint presentations. Interestingly the images in the electronic version are in color, not black and white.

Naturally, each article has a bibliography of references and further readings, but they are selective, and not as long as in some other, more focused encyclopedias like Academic Press’ *Encyclopedia of Biodiversity* (2000, 0122268652, $1,295) [Amazon has used sets from $705] and Macmillan’s *Encyclopedia of Bioethics* (1995, 0028973550, $525, but out of stock indefinitely). However, collectively they make up an impressive resource and in the electronic version, there are links to some of the articles via CrossRef (the library needs to be a member) and PubMed which provides abstracts. In addition, the online version has a “Reference Search” function that lets the reader search the references and further readings listed in all the articles.

The articles in the print and online versions are similar in structure. Besides the actual text, each article includes the authors and their affiliation, as well as a short description of the article. The articles themselves are divided into sections, which are listed in the article table of contents. The online version also lists the keywords or descriptors the article has been assigned. Of course, the layout is different and in this regard, the print version has the upper hand. The print ELS used two blocks of text on each page and the type is highly readable. The illustrations are clear and are used to break up and complement the text nicely. Aesthetically, this beats the scrolling and thumbnails of the electronic version. (However, in the electronic version you can download and print a PDF version of the print articles.)

Regarding the organization and access to the articles, the print set has all the finding aids you would expect from such a high quality production. The articles themselves are arranged alphabetically throughout the 19 volumes of text and “see” references to related articles are interspersed throughout each article. While each volume has a list of articles it contains, volume 20 has a contents list for the entire set, as well as a topical index that lists all articles classified under the core areas mentioned earlier. In addition, volume 20 contains a study guide intended continued on page 70.
for the non-specialist consisting of 300 selected introductory articles. These articles represent each of the core subjects. This study guide fulfills its purpose in acting as an overview of each subject and as a guide for initial exploration. But the real show piece of volume 20 is a 435-page comprehensive subject index that provides access to relevant volume and page numbers.

As impressive as the organization of the print set is, the electronic version has its own set of organizing tools with unique qualities. The “see” references of the print version are replaced with direct links to related articles within the text. In place of the contents list in volume 20, you can use the A-Z Browse function to browse and link to articles titles alphabetically. Substituting for the topical index is the Subject Browse function providing hierarchical browsing of articles from core subjects like ecology down to the more specific microbial ecology, then to protozoan ecology, and finally to the article on protozoan symbiotes. Of course, all of the article titles listed here are linked directly to the text. In short, the electronic version provides many of the same finding aids as the print but adds the functionality of a Web-based product. However, all is not perfect. The electronic subject index is still in beta mode and for those items contained in the index, the linking is less than satisfactory. Trying to locate information on ABO blood types I clicked on “ABO blood group system” in the index and was given a selection of 4 articles. I clicked on the article entitled Blood Group Incompatibility and was taken to the beginning of the article, not to where the information would be in the article. Obviously it would be more helpful to be taken to where the information is located, immediately, and not have to scroll. Compounding the problem, using the “find” command in my browser did not locate “ABO” even though a short scroll down the page found it.

Search functionality is always a big advantage of a Web-based resource and the same holds true for the ELS online. There are a number of search types available including the quick search function, the standard search and the advanced search. Quick search is limited to a word search in the article titles. Standard searching is far more useful but it requires getting use to. While it defaults to searching in articles titles, it allows searching by author, keyword, free text, and illustration. But some clarification is needed here. Keyword searching is really descriptor searching. All articles are assigned “keywords” or descriptors and it is these descriptors that are searched in a keyword query. In order to search the full text you need to click the “free text option.” Another useful functionality is the ability to limit by article type: introductory, secondary or special essay.

While the standard search allows boolean searching via a drop down menu between two terms or phrases, the advance search uses a template to allow more complex boolean searching among different fields. You can enter search terms in text boxes to link authors with article titles, keywords or free text.

The Web version of the encyclopedia offers other interesting possibilities. It can be tailored to individual use via the My ELS function. This allows users to create password-protected Web pages “within which articles and illustrations can be bookmarked, and organized into customizable folders.” In addition, the Workgroups function extends this capability to groups of students by enabling them “to share bookmarks, links and other material on a private part of the ELS site.” With all this functionality, ELS has the potential to become the focus of individual research, as well as a center for community learning. Of course, it is an open question whether students or faculty will use it in this way, but the potential is there. One thing ELS developers should consider, if they haven’t already, is the possible relationship of ELS with existing courseware like WebCT and Blackboard.

There is little doubt that the Nature Publishing Group is committed to the online ELS as its premier version of this product. It is a work in progress with big plans. ELS is continually updated and notice of the most recent, as well as the next planned update, are posted on the home page. In the “What’s New” section of the Web site there are links to the most recently added articles, as well as a list of those that are forthcoming. There are also links to the latest research as reported in the journal Nature. No such updating is feasible with the print set, and in fact no new print editions are planned. This 20-volume set is the first, and last, print version of this reference work.

All this is important because the Nature Publishing Group’s ELS model is an emphatic statement that electronic reference publishing is moving to a new level. While the print version of ELS is an exceptional reference work, it has limitations in terms of updating and functionality that are overcome in an electronic environment. What the Nature Publishing Group is saying is that the value added by the electronic version of this reference work outweighs the aesthetics of the print set. This is reflected in their pricing model. As Sean Pidgeon says in his ATG interview (see page 60), “the bundle price is not structured as the full print price plus a bit extra for online, but rather as full price for online plus a discount on print ($1500 for online + $3360 for print). The principal income stream for this reference work is the anticipated annual subscriptions to the online version, not sales of the print set.

As Fran Wilkinson and Linda Lewis noted in this issue’s lead article (page 1) “Five years ago the question seemed to be ‘Do we want it in electronic format in addition to print?’ Now the question seems to be ‘Do we want it in print, in addition to electronic format?’” That may still be an open question in some circles, but the Nature Publishing Group is betting the long term answer is No. How many other reference publishers are coming to the same conclusion?

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**Book Reviews — Monographic Musings**

Column Editor Debbie Vaughn (Reference Librarian, College of Charleston) <vaughnd@cofc.edu>

Once again, I am indebted to Phillip Powell and Michael Litchfield for their critical contributions. —DV


Reviewed by Phillip Powell (Reference Librarian, College of Charleston) <powellp@cofc.edu>

The serious, hardcore medieval scholar will quickly skim past this book. There are many other efforts that satisfy the research needs of the medievalist. Castles and Fortified Cities of Medieval Europe: An Illustrated History is written for someone with a basic interest in medieval warfare as it occurred in Western and Southern Europe from collapse of Rome until approximately 1600.

<http://www.against-the-grain.com>