



electronic referencing

We all need a good reference

The unstoppable increase in information has called for better, more efficient record-keeping. *Felix Grant* charts the move from file cards to electronic referencing.

Scientific research starts with a survey of the available literature and, all being well, finishes with an addition to it. What is found in the first phase must be referenced in the last – and kept track of in between.

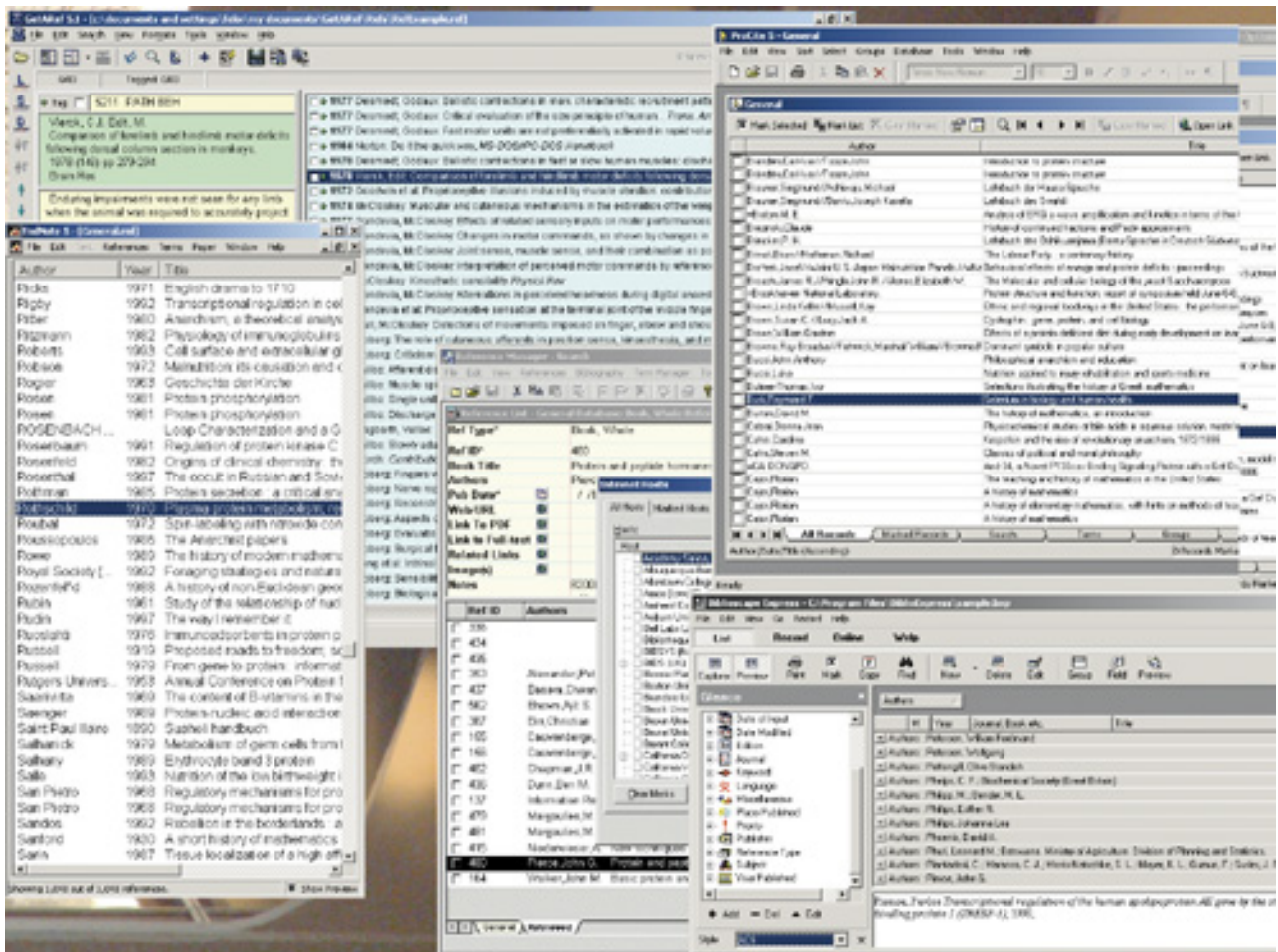
When I was a student, 5x3 file cards were the keys to the kingdom. Everything went onto them – notes were made on them, term papers and dissertations were assembled on or from them ... and, of course, source references resided on them. Whether you stressed out late into the graveyard hours or relaxed in the bar depended on your skill with the cards. Computerisation has brought us a long way since those days; but the underlying principles haven't changed. The information has moved from cards to disk; but some means must still tie together structured and freeform fragments into an easily navigable whole. There are two main types of approach to reference management.

The first is to start from a pre-existing software regime, seeking a means by which reference handling may be organised, tamed and then integrated. The other is to start from scratch and build an environment within which research is written, with referencing as one of the dominant concerns guiding its overall design. The first is usually called bibliographic software, while the second is dubbed research information management software.

Before starting, it's worth asking the usual question posed by budgetconscious institutions asked to buy bibliographic software for the first time: 'Why can't it be done with our existing database manager?' As an experiment, I set up an Access database, a mailmerge in Word, and a macro to link them; the result of my labours was a slow and clumsy substitute for core bibliographic storage, citation and formatting facilities. Getting my creation right at this minimalist level took a number of hours which, even at national minimum wage rates, made purchase of a ready-made solution economically attractive.

There are a surprising number of applications and systems available and I selected only a few of them to be representative of the whole. Unusually, I felt in no danger of taking sides; these are all, without exception, first rate products which I thoroughly enjoyed using.

No look at this area, however cursory, can ignore the ‘big three’ products now owned by ISI ResearchSoft: EndNote, ProCite and Reference Manager. These all lie primarily within the first, ‘bibliographic’ approach mentioned above. Firmly in the ‘research information management’ corner are the two Workstation complexes from Nota Bene, which include Ibidem, a dedicated bibliographic database utility (hereafter called ‘NB Ibidem’). More complicated are GetARef (from DatAid AB of Sweden) and a graded range from BiblioScape, which in different ways straddle the divide. All of these are available in evaluation versions, for download before purchase.

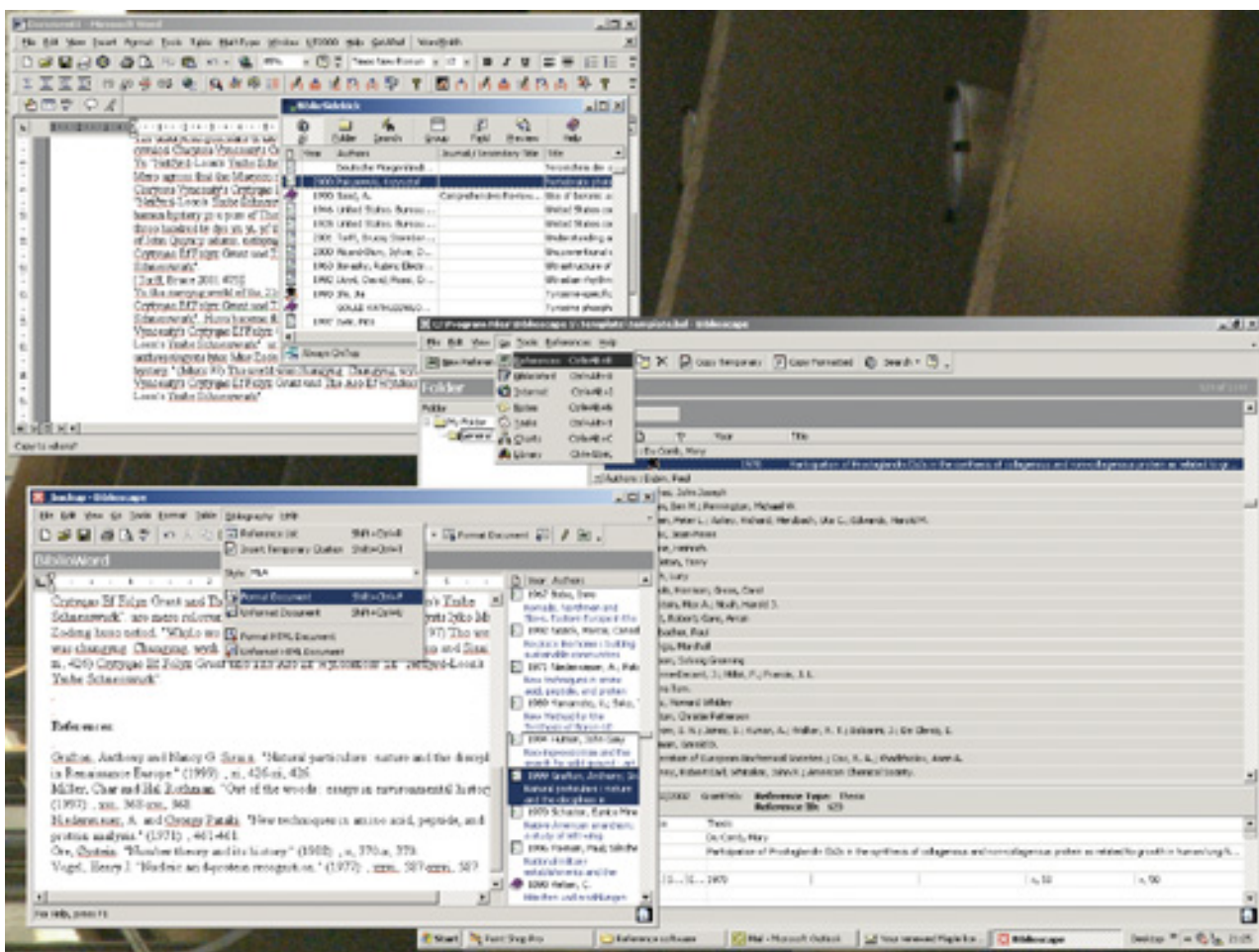


- The five products in the bibliographic software group, clockwise from top left: GetARef 5.1, ProCite 5, BiblioExpress, Reference Manager 10 and EndNote 5.

References have to get into the software somehow. I started with a tiny, easily manageable database of 21 references. The reference types were deliberately eclectic (books, journal articles, films on DVD, and so on) as was their content (ranging from the bare bones of author and title through to full details with extensive abstract). This was entered into each application manually, small identifying changes were made, and an export/import transfer made between every pair of products – EndNote to BiblioScape, BiblioScape to GetARef, and so on. Each was then set to import much larger reference bases. If you intend to start a reference base from scratch, and do not envision sharing your references with others, this sort of interchange may not concern you; but for most of us it will be a consideration.

With all of the programs, these tasks were satisfactorily accomplished. The most import headaches were caused by an abstract containing many carriage returns, itemised list elements, brackets, symbols, etc. In several cases, this required a test pass through the data to find the best

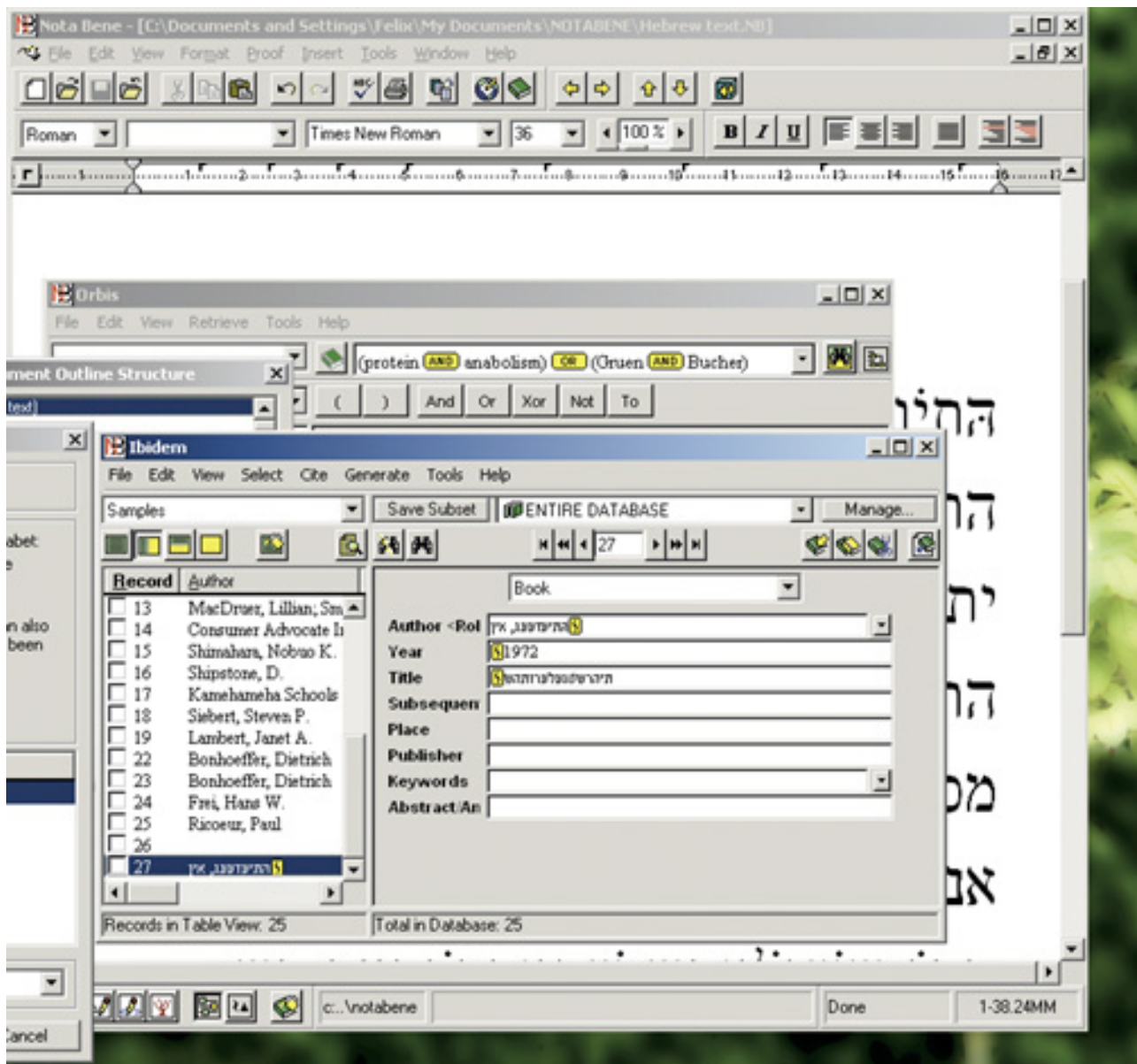
approach – hence the use of a small reference base for the experiments! It seems strange, these days, that one cannot simply pick up references in one product and drag them to another.



- *BiblioScape in use as, from top left: BiblioSideKick feeding and formatting references in a Microsoft Word document, a bibliographic manager, and BiblioWord inboard word processor receiving formatted references from the bibliography sidebar.*

The smoothest inter-package transfers were, unsurprisingly, between ISI Researchsoft's three offerings. Each will read data from the other two in its native format, and without hitch. There is, of course, some difficulty where a feature in one product is missing from another; Reference Manager, for instance, can package links between references and the original electronic documents (web, PDF, graphics, full text) to which they refer but EndNote and ProCite cannot.

Things become much more uncertain when moving between stables. ISI Researchsoft's three packages will import from, and export to, common tagged text formats such as the UNIX 'Refer' structure. NB Ibidem, on the other hand, seems completely uninterested in importing references from file. This is understandable in the light of its design philosophy as an individual researcher's writing environment, but is nevertheless my only criticism of a product with which I otherwise fell deeply in love. The test bibliography was imported to, and exported from, NB Ibidem without problems.



- *Nota Bene in use: Ibidem reference manager (foreground) feeding references (one in Hebrew text) to a Hebrew document (background). Between, Orbis is searching note references for a compound expression and an outline structure is being defined.*

BiblioScape, in all its forms, works very hard at facilitating import – it is the best (although not always the fastest) of the batch. It shows less enthusiasm for export, but still offers not only the widely used Refer format but also support for EndNote and Reference Manager.

Impressively, even BiblioScape's freeware bibliographic product BiblioExpress will import and export the EndNote version of Refer format at astonishing speed – a 2Mb, 1,000 reference file imported in under five seconds.

GetARef has given the most thought to wide acceptance of import, offering a number of means to add individual 'dumps' including e-mail receipts. This is the hardest import to set up initially but it is the most powerful once everything is finally working.

For a given package, it could be said that a reference base is 'large' if it approaches the program's storage capacity limit. Taking 75 per cent as a reasonable approach, I put the packages through their paces with fabricated databases of between 12,000 and 240,000 records on a 1.2GHz PC running Windows XP in 512 Mb RAM.

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The first lesson I learned was that imports of these sizes take a very long time. Procite imported a 7.5Mb file containing 14,112 references in just under a minute; EndNote took almost twice as long. GetARef, once the initial set-up headaches were over, was the quickest; the 14,112 reference test file was imported in 15 seconds. Even GetARef had to be left working over the lunch break on 240,000 references. Once in, data needs to be handled in different ways and, here again, speed varies.

GetARef indexed all fields of a reference base at about 10 times the speed of EndNote, and then found all 23,000 instances of a single search string in about half of the time (and in more detail).

It's important not to be dazzled by comparisons; think long and hard about what you really want your software to do. Do you expect to regularly import large existing reference bases from foreign file formats, or is it likely to be a one-off initial exercise followed by incremental updating – or will you start your reference base from scratch and maintain it incrementally as work progresses? In the first case, it is worth taking time and trouble to set up import routines that work well and quickly ... in the other two cases, ease of use will be more attractive. If you have only 1,500 or so references in your database, then indexing is hardly worthwhile and searching will probably take well under a second regardless of the product you use. If you expect to amass a quarter of a million references then searching and indexing speed, as well as capacity, become much more significant. And so on.

Import from well known reference sources form the bulk of dataentry, and one of the selling points of such software is the ability to handle these. GetARef is, once again, particularly strong in this area – although, also once again, particularly demanding in its initial set-up.

For individual references, or bulk additions based on specific search criteria, the key is Z39.50 – a compliance protocol that makes electronic bibliographical information available from many internet-connected libraries including universities, national collections and commercial sources. All three of the ISI Researchsoft products have extensive collections of Z39.50 connection files. Reference Manager offers a graphically sleeker and friendlier, web-like face, and more flexible Boolean search logic, while EndNote is easier to learn and ProCite is somewhere between the two. BiblioScape does not provide Z39.50 connectivity as such; it will, however, directly capture from the web interface that Z39.50 sites increasingly offer – as will GetARef.

NB Ibidem does not itself garner information from Z39.50 connections but stores the results of a companion product (BookWhere, produced for Nota Bene by SeaChange Corporation).

Bibliographical references are not an end in themselves. Typically, they are a means by which you, your colleagues or your readers can readily access the source materials, which they catalogue, within a larger information framework. That larger framework typically includes other, non-bibliographic information stores on which you will draw, and a document that you are producing. The purely bibliographic programs assume that you will supply software for these yourself: the information stores in other databases, the document in a word processor. The other data are not their concern; but they must make available to the word processor a means of both citing and referencing quoted sources in a required style: the manner in which a reference is formatted for a particular journal or publisher. If you reference the same book in two different papers, you may be required to show it in one case as 'Bloggs, J. Ferret-Wangling for Xenobiologists. 1999. Bluster and Verbose Inc. Bookville.' and in the other as 'Ferret-Wangling for Xenobiologists; Juliet Bloggs. Bookville, 1999: Bluster and Verbose.' Choosing the required

style will handle this transparently.

Four of the bibliographic products looked at here will fulfil this role with every RTF-capable word processor I tested. BiblioScape, via its BiblioSidekick utility, provides a small panel on top of the word processor for the same purpose, although it does not work with WordPerfect 10 (this is asserted to be a WordPerfect issue). The slickness of the citation process varies: with BiblioSideKick, EndNote, ProCite and Reference Manager you simply drag the reference you want into the place where you want it, while GetARef requires that the citation is generated first and then pasted into the word processor. BiblioSide- Kick ‘floats’ as a separate window, while the other four install themselves as additional menu options and/or toolbar buttons in your word processor. Once the citations are in place, the bibliographic software then generates the bibliography, formatting it and the citations to the required style – and updates the results if required, to reflect changes in the document. BiblioExpress does not make this process a part of its remit; NB Ibidem does, but is described below.

Between my two market categories come, strictly speaking, GetARef and the ‘Lite’ version of BiblioScape. All editions of Biblioscape have here been assigned to the research organiser category below. GetARef, however, seems to me most at home in the bibliographic camp; its author would probably disagree.

Research organisers have the same responsibility for citation and reference handling as the bibliographic software, but take on additional roles as well. Where the bibliographic programs claim to replace those 5x3 file cards on which I wrote source references, the research information organiser seeks to absorb the cards on which other material was stored, the wordprocessor functions of other software applications, or all of these. Nota Bene (including Ibidem) and BiblioScape both fall into this class of product. Nota Bene and BiblioScape each have their own, built-in word processor. Nota Bene comes in two configurations; Scholar Workstation, which contains the core system, and Lingua Workstation, which adds extensive foreign language support. Non-bibliographic material is handled in two ways: through separate flat file databases also managed by Ibidem; and through Orbis, a powerful indexed freeform text database which allows researchers of my vintage to mimic the file card idea explicitly in its note forms.

Nota Bene in its ‘Lingua’ incarnation it is also one of the few environments which properly handle non-Roman alphabets: Greek; Cyrillic; and right-to-left Hebrew a keystroke away; with Arabic and Urdu achievable, I discovered, with a little thought and planning. Ibidem serves the Nota Bene word processor in every way as the standalone bibliographic programs serve MS Word or other third party word processors, but the handling of citation and reference styles is more integral. Specify the style when you start writing the document, and the referencing follows suit. Its extension to other, userdesigned flat files, in conjunction with Orbis’ ability to interrogate NB textual material, provides an extraordinarily powerful framework.

In Orbis, and in Ibidem’s extension to other data, NB is embracing all those file cards beyond the bibliography, where notes were stored and dissertations incubated. In this respect, BiblioScape is firmly in the same territory as Nota Bene; but its approach is profoundly different and will suit different circumstances. First, and most obviously, the inboard word processor BiblioWord (a simpler affair than Nota Bene, saving only in RTF or HTML) is not the central concern of BiblioScape; that position goes to the bibliographic unit.

BiblioScape comes in four flavours: Lite, Standard, Professional and Librarian; the copy

supplied for review was the highest in the range, the Librarian edition, and some of what I say may apply only to it. The Lite version can be seen as a competitor to the bibliographic products and so, on pricing terms, can its Standard sibling. Nevertheless, beneath the surface BiblioScape suits a very different type of user. The word processor and bibliography share space with a hierarchic notes module, a very thorough task management facility, charting capability and (in the Librarian version) capacity to manage a complete research library including loans and interloans, circulation, subscriptions, suppliers, and the rest. Crucially, these modules interlink.

So, in conclusion, what emerges? As Donna Kirking of ISI ResearchSoft rightly points out, there are no hard and fast rules for predicting which product will suit a particular user. Nevertheless, some broad recommendations are possible.

If I only wanted a storage container and reference list for my bibliographic records, including import from file sources, and cited them infrequently, I would be happy to format my references manually; in that scenario, the freeware BiblioExpress is ideal. It would also serve as a good means for supplying bibliographies and reading lists to others (students, colleagues, publishers) from my own collection stored in another product. And it does first-rate duty as a bibliographic collection tool if your work takes you into traditional paper-based libraries with no Z39.50 searchable online catalogue.

If citations are more frequent, you want to search online, or you wish to more extensively search and manipulate your bibliographic database, but have no intention of abandoning or supplementing your existing processor and organisation tools, you should look at the other purely bibliographic packages. For a no-nonsense utility, which is easy to learn, use and maintain, EndNote takes a lot of beating. If you have greater needs, I suggest thorough, hard-headed test drives of all four alternatives (BiblioScape Lite, GetARef, ProCite and Reference Manager) with a carefully thought out needs analysis in hand.

For a team environment specifically oriented to the smoothest and most efficient writing of reports and papers, with bibliographies built up from scratch throughout the process, I would put my money on Nota Bene (probably with BookWhere). If the same individual, team or institution wanted a similar environment but with larger capacity and bulk updating from file, preserving existing use of MS Office, I would shift my recommendation to one version or another of BiblioScape.

Remember, too, that it's no longer necessary to restrict choice to a single product. I have found myself frequently using two or more of the products in combination. EndNote, for example, often went off onto the Internet as my Z39.50 hound, sniffing out references which, after initial examination and selection, were exported as a bulk file update to BiblioScape which, in turn, added to a temporary RTF version of a paper which originated in, and then returned to, WordPerfect or Nota Bene.

In the normal way of things I review a product, recognise its value, and let it go. As this review period comes to a close, things are markedly different; I am deeply sorry that I must give up any of these products.

Every one of them has proven delightfully useful and usable; most of them even justify that overused and normally embarrassing industry buzzword: 'sexy'. I would recommend each of them without reservation, separately or in concert, to somebody (or some institution) I know. Download all of them in evaluation form, enjoy them, and then take your pick.

Pricing

The prices of these products vary tremendously. The buyer's status (private, education, institutional or student buyer), packaging options (download or shrink-wrapped CD with manual) and features required will affect the price. The table gives the top and bottom range limits found at the time of writing.

BiblioExpress **Freeware**

BiblioScape Lite **\$49-\$79**

BiblioScape Standard **\$99-\$139**

BiblioScape Professional **\$199-\$299**

BiblioScape Librarian **\$499-\$699**

GetaRef **\$129-\$299**

Nota Bene Scholar Workstation **\$249-\$449**

Nota Bene Lingua Workstation **\$349-\$549**

EndNote **\$100-\$330**

ProCite **\$110-\$356**

Reference Manager **\$100-\$356**

Horses for courses

I asked Donna Kirking and Nancy Matus (of ISI ResearchSoft) and researcher Benoni Edin (who wrote GetARef for his own needs and is now its publisher) to comment on differences between their bibliographic products. Their replies fitted well with my own conclusions after working with all three packages.

Donna Kirking began: 'The three different [ISI-RS] products have their own personalities and appeal. EndNote is the most userfriendly, with the smallest learning curve, and appeals to those who consider ease of use. ProCite has the most flexible database, with the greatest number of fields and predefined reference types, as well as advanced search capabilities, and appeals to users who want great flexibility and detail. Reference Manager is the most featurerich program and has true networking capabilities, allowing more than one user to edit a database simultaneously, and appeals to those who need to share write access... I hesitate to categorise users ... I would ... suggest they go to the comparison chart on our website, then download the trial version of the program they are interested in and try it out before making a final decision.'

Nancy Matus added to this: 'EndNote is used by researchers, writers, students, and librarians. ProCite support[s] advanced organization and presentation subject bibliographies, grouping and unlimited reference types a favourite among information professionals, librarians and researchers. Reference Manager is popular among workgroups who benefit from a true network edition found in corporate, academic and government workgroup environments.'

Benoni Edin commented that: 'GetARef wasn't designed to primarily generate reference lists (it's questionable if it's worthwhile to buy expensive software and to keep databases updated

just to generate a handful of bibliographies a year). For that purpose I could have used EndNote or Reference Manager. GetARef handles reference lists and bibliographies as well as any other software, but more important [is] handling reprint libraries, keeping personal notes, importing references, handling multiple collections, etc.'

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