Book reviews

Diane Lees, Editor, *Museums and Interactive Multimedia. Proceedings of 6th MDA and the 2nd ICHIM conference*, Cambridge U.K. September 1993. Published jointly by Museum Documentation Association, Cherry Hinton Road, Cambridge, and (as Archives & Museum Informatics technical report No. 20), by Archives & Museum Informatics, Pittsburgh. 1993. 436 pp. ISBN 0 905963 89 X.

This publication of 436 pages contains some sixty papers which were presented at the above meeting. It represents a very broad coverage of the subject under the main headings Applications in Museums, Design and Development, and Impact and Implications of Multimedia; it is mandatory reading for those who need a review and up-date of this important field where multimedia applications are catching on.

However the support for museum multimedia seems very patchy. Scott Sayre, in describing some activities at the Minneapolis Institute of Art in "The evolution of interactive interpretive media" says that the Institute received $1,000,000 from the General Mills Foundation for the development of interactive video programs. Ruth Perlin from the National Gallery of Art, Washington, writes in "Education and access" that their work was funded by the Annenberg Foundation "including provision for giving 2,500 copies of the videodisc to educational institutions in every state".

Philip Yenawine says, however, in "Multimedia and the politics of museum organisational change" that "we were unable to organise any forums for discussing specific issues involved for museums in multimedia publishing ... any attempt to get a large community of museum people to think beyond rather narrow and institution-bound issues, particularly considering policies with regard to reproduction rights and fees for "venture" projects in multimedia, proved unproductive".

Yenawine is obviously disillusioned about the whole business, because he concludes "although we have given up all staff and our office because of the lack of funds, we still exist as an organisation ... etc". These remarks have the same tone as comments made by David Bearman, Editor of *Archives and Museum Informatics*, a newsletter from one of the co-publishers of this book. Bearman reports on the failure of a number of museum projects due to lack of funds including, incidentally, the RAMA European Inter-Museum Telecommunications project.

Xavier Perrot in "Applications in Museums" says that the United States had about 5,000 museums in 1984. He continues: "gathering images and digitising them might be a huge and expensive task". In fact this task is probably by far the most costly part of the preparation of a museum multimedia presentation.

The operation is well described by Ben Booth and Christine Heap in "High resolution digital image storage at the National Railway Museum, York". In this project, images were scanned and stored at 2500 × 3500 pixels, expandible to 5000 × 7000

pixels in full colour. It seems that an important reason for adopting this very high resolution is that many of the negatives from the museum's photographic archive have deteriorated and the need for conservation is important.

Some photographic adjustments were required at the time of scanning which was rather slow. While a scanning rate of 20 negatives per hour was sometimes achieved, Christine Heap tells me that the average rate was 5 to 6 negatives per hour. The scanning equipment used was supplied by Primagraphics, incorporating a special camera, stand and light box costing up to £10,000. The imaging equipment, a modified work station, cost up to £70,000. Primagraphics say that some of the adjustments during scanning might have been done automatically at extra cost. For example, contrast enhancement could be done by histogram processing.

Returning to the article by Scott Sayre, Sayre emphasises, as most people know, that "the ever-expanding capabilities of interactive media make it easy to become overly concerned with the technical aspects. However the MIA's experiences demonstrate that the development of appropriate effective content is still the most difficult part of the process".

Pursuing the question of content, Larry Friedlander in "Making the punishment fit the crime" says: "In multimedia the designer must shape a unified focused meaningful experience, moment by moment, out of the richness and potential of the medium. Museum programs often confront the user with an overwhelming onslaught of pictures, texts, diagrams, and audio which have not been adequately formed and selected ... overwhelmed by the sheer mass of information, the visitors were reluctant to continue accumulating more facts, when, indeed, they seemed not to know what to do with those which they had already collected. After a while they stopped engaging with the experience and simply gave up".

Some organisations are able to use advanced technology in their work. Howard Besser, Canadian Centre of Architecture, describes the equipment he uses in "Visualisation of historic urban data". The database "resides on a Silicon Graphics Crimson workstation capable of visualising 3D information in various ways".

Hypertext-based systems continue to be used. Franca Garzotto (Milan Polytechnic) discusses the Hypertext Design Model (HDM), which he originated for consistently organising hypermedia structures. In "Hypermilano: hypermedia navigation in a city information point", he describes free navigation, guided navigation, and linear, nested, branched, lattice, and automatic guided tours. These terms describe particular kinds of navigation in an attempt to avoid disorienting users.

Lanzelotte, of the Computer Science Department, Rio de Janeiro, also describes a hypermedia-based project, and discusses ways of determining the authenticity of paintings. In "The Portinari project" he writes about a method of classifying brushstrokes as a means of uniquely identifying a painter.

James Hemsley reviews "Design and development of systems for museums and galleries". He suggests that matters arising for a "new paradigm" are:

– Rising user power;
– Increasing importance of "content software" versus "computer software";
– The switch from computing technology to two technologies – computing and video (& multimedia) and then the inclusion of a third – telecommunications;
– Increasing speed of technological change;

– International collaborative efforts.

Hemsley repeats what is said in other papers: "In certain types of computer systems work it is the *content*, not the hardware nor the software, which constitutes the biggest single cost component". In the Geographic Information Systems area for example, figures for costs as high as 70% of the total cost of the project are sometimes quoted.

Hemsley quotes from the Philip's IMS CD-I Design Handbook: "most CD-I designers agree that, while it might be tempting to exclude programmers from early stages of design and development, it's a good idea to have someone around who thoroughly understands the technical aspects of CD-I and can quickly spot any potential pitfalls before effort has been wasted on designing something that can never work".

In regard to computer problems, Hemsley considers that computer systems are risky and accident-prone, and he cites "a space-shot aborted because of a missing comma in the code, malfunctioning of medical equipment due to software errors leading to human injury and death, and financial failure/disruption of companies due to software difficulties both at operational and development phases".

Hemsley thinks that a skilled, multi-disciplinary team is needed whose skills include researchers and writers specialising in content, graphic designers, user representatives – for example curators and educators – human factor specialists, software and other technical staff, photographers, sound and video staff for new materials, project management staff, creative directors, and marketing people for products.

With regard to "relevance, participation and motivation in hypermedia design" Jonathan Cooper says "visiting a museum is, for the majority, about affective experience, not cognitive research .... Most visitors are collecting impressions and experiences that will make sense later in conjunction with other experiences and activities in their lives .... In order for hypermedia to be effective for the novice visitor and gain a sense of playfulness ... developers ... need to use as a model ... the divergence and relative unpredictability of surrealist cabaret (or at least the live floor talk!)".

Ann Fahy (Victoria & Albert Museum) et al. list four routes to finding information about objects in their piece "Hypermuse; a prototype hypermedia front-end for museum information systems" – by name, geographical location, date and feature. Unfortunately they do not elaborate on the retrieval power of object "features".

There are three papers in the section entitled "retrieval strategies" and three only, in which retrieval by feature is discussed. Ann Marie Guimier-Sorbets from the University of Paris questions the effectiveness of keyword indexing in "An experimental multimedia information system based on querying text in natural language". A paper in the same group by Matteo and Panzeri discusses an "Automatic system for lexicon control of iconographic description" based on Iconclass – a comprehensive art thesaurus – and on Garnier's Thesaurus Iconographique, using enriched descriptors.

Another paper in this group moves on to relatively new ground. Corinne and Peter Jorgensen and Matt Hogan, of Syracuse University talk about "The visual thesaurus; a practical application". The novel part of the proposal involves dividing the picture into quadrants, or possibly into further sub-divisions, and dragging a selected term (Iconic index term) into the appropriate part of the image, thus forming a question of

a kind "search for a picture containing this icon in this part of it". Testing on a picture database is about to start.

A useful article about the exchange of multimedia information is provided by John Perkins entitled "The CIMI standards framework". Copyright problems are discussed by Christine Steiner in "Multimedia licensing contracts; uses and rights".

In "Impact and implications of multimedia", Kent Lydecker (Metropolitan Museum of Art, New York) says "interactive multimedia are reshaping the idea of a museum; indeed, some museums have even been conceived around these technologies alone, rather than around the traditional notion of a collection".

Christian Lahanier and Michel Aubert describe the "network of art research computer image systems in Europe (Narcisse)". This is a very ambitious project involving electronic storage and access to a large number of documents and paintings at cultural institutions in Europe.

The scanner being used will provide X-ray images of pictures of up to 8000 × 6000 resolution requiring 72 Mbytes of storage. A complete picture, requiring, say 12 separate X-rays would require 864 Mbytes. The normal resolution is 2000 × 3000 pixels. A monochrome photographic image is also produced stored as 288 Mbytes. A prototype system comprising 300 paintings will require 5 optical discs each with a capacity of 10 Gbytes.

A curious aspect of this system is that the images will be controlled by a multilingual text database in German, French, Italian, and Portugese, although the article itself is in English. A colour brochure in four languages, presumably the same four, has been published to attract more co-operation, and 2000 copies were distributed internationally. It seems odd that the English language is not featured in this project. However, the article includes one reference – the only one in the article – to an English publication, and an ancient one at that – *Leviathan* (1651) by Thomas Hobbes, a political philosopher. *Leviathan*, Hobbes' most famous publication, was critical of the power of the church and religious obedience.

Ian Stevenson and Marion Howard Healy, *ATM; Market Strategies*. London: Ovum, 1993. 336 pages. ISBN 0 903 969 86 4.

This publication is one of Ovum's series of comprehensive reports, in this case about a specialised technical subject. ATM is likely to become widely used and the table of contents for the book immediately reveals its purpose. It is aimed primarily at large corporations and people interested in the business success of new activities and the often new companies who partake in them.

The sections of the book are entitled "Management summary", "Market development – drivers and scenarios", "User demand for ATM", "Technology", "The work group and backbone market", "The overlay switch market", "The core network market", "Network operators plans for ATM and broadband services", "User profiles", "Supplier profiles" and "Glossary".

The authors say: "ATM is here to stay – the basic transmission philosophy will exist well into the next millennium. It is the only technology which can be deployed end-to-end in a network to bring benefits of efficiency and simplicity. B-ISDN is dead ... ATM is the only technology which supports real-time voice and video".

Although ATM is a specialised part of telecommunications, and you may not be a telecoms person, you may wish to refer to this publication which covers a subject which will steadily increase in importance. It seems likely that the assertions made by Ovum, as quoted above, will turn out to be correct. In fact Stevenson and Healy go further, considering that "Any technology other than ATM can only be a temporary solution. Many businesses realise this and are including ATM in their strategic planning. We find that users expect 1996 to be the watershed for next generation applications".

I do not think that the six pages in this book covering the fundamentals of ATM provide a clear explanation of its functions and advantages, so I will take the liberty of providing one. You can only judge whether it is any better by obtaining a copy of this book.

ATM is a technology which embodies the advantages of both circuit switching and packet switching. This makes it attractive for both network providers and users. Circuit switching means that users are interconnected by a channel – for example a telephone line – via conventional switches which make the user-line-user connections. It is a physical path set up for the duration of the call for the sole benefit of its only users.

In packet switching (PS), switches of the kind that you and I can easily visualise are not used. PS is a technique which packs the same amount of data into a network of much smaller capacity than is required for a circuit-switched network carrying the same amount of data. It does this by splitting up messages into packets which are sent in "time slots" within a stream also containing packets from other users. Each packet contains a destination address, so packets may be re-formed into a complete message when they reach the addressee. The network is filled almost to capacity with parts of messages fed into it, as time slots become available for each part.

As a time slot occupies a very short time interval, if a gap occurs in data transmission between users – for example during a telephone conversation – it is immediately occupied by as many packets from other users as there are time slots during that gap. Consequently, the data occupancy of the network is considerably higher than in a circuit-switched network where a channel is available only to its users even when it is empty of data for most of the time. PS includes other advantages such as error correction and multiple-route availability – if one route fails another is instantly available.

A problem with PS is that it may extend the length of a long message, as encountered in videoconferencing or multimedia, to an unacceptable length because of the random occurrence of time-slots and waiting times for the next empty time slot. With ATM, timing is arranged in such a way that when a packet (called a cell in ATM) is transmissed, the next packet is sent after a very short time interval – usually a few microseconds long – compared with milliseconds for packet switching.

Another major advantage is that ATM is "scalable" because its format is independent of transmission rate. It may be used in LANs, WANs, etc., at whatever data rates may be dictated by the available bandwidth, ranging from 10 megabits to hundreds of megabits per second. Because users pay only for cells despatched, not for bandwidth which is available but which may never be needed, it is versatile and relatively cheap.

However, so-called "ATM switches" exist and are very important, although they do not consist of contacts or semiconductor on-off switches. For example an ATM switch could be interposed between a LAN and, say another LAN, both LANs being configured as "hub" structures. Instead of the workstations being connected directly to the LAN where inter-communications are restricted because of shared bandwidth, each work-station has a line direct to a switch port capable of full-bandwidth rates regardless of the other LAN traffic.

This explanation is only a small part of the story but it should suffice to convey the flavour of ATM.

Returning to the Ovum report, market forecasts are given for the applications of ATM technology to LAN and Broadband networks. The main ATM "product" will be interconnect services and switches. The need for these products is the very wide band of data which ATM is designed for.

Ovum consider that the maximum number of LAN user sites – an expected ATM market – in different countries, are about 7.7M in the United States, 1.9M in Germany, 1.8M in the U.K., and 1.24M in France. ATM switches which cost $50,000 each in 1993 will drop to $20,000 each in the year 2000. Revenues are forecasted at $12M, $3M, $3M, and $2M for the U.S., Germany, U.K. and France respectively, increasing by the year 2000 to $1.3 Billion, $394M, $310M and $225M for the same countries.

The total number of Wide Area Network (WAN) sites are predicted at 4,600 in 1994 rising to 69,000 by the year 2000. The market in the United States, Germany, U.K. and France for ATM switches and services in wide area networks will be $161M, $4M, $25M, and $14M respectively in 1994, and $2.88 Billion, $252M, $639M and $352M in the same countries by 2000.

Eighteen European companies have joined the "ATM Pilot". An experimental network will run in Europe starting in 1994 using a data speed of 34 Mbps with speed increases later. Eight user profiles are given, one of which is in the U.K. – Cambridge University. The university is one of the sites to be connected to SuperJanet. It has agreed to connect its private fibre network with the local cable company, Cambridge Cable Ltd., for experimental purposes. BT will be implementing ATM on behalf of the universities in the SuperJanet network using Alcatel (France) and AT&T switches. Mercury is also starting ATM trials about now.

David I. Raitt and Ben Jeapes, editors, *Online Information 93*. 17th International Online Information Meeting Proceedings. London, December 1993. Learned Information: Oxford and New Jersey, 1993. 672pp. ISBN 0 904933 85 7.

The remarks which I made about a previous edition of this publication which I reviewed, also apply this year. The large collection of papers drawn from a wide area of IT and library science provide a good indication of current trends. In this 1993 edition, with a total of about 66 papers, multimedia and communications/networks are each represented by 7 papers, CD-ROMs by 6 and imaging by 4. The remaining papers cover many topics such as information markets generally, electronic journals, databases, methods of searching, and so on.

Among the papers which seem to be of special interest are two covering legal aspects of multimedia – "The commercial exploitation of multimedia opportunities; a legal view" by Alastair Breward, and "Copyright law, information services and the challenges of multimedia" by Andrew White.

Breward writes about social and regulatory issues, property rights and standards. Both Breward and White discuss copyright difficulties at some length. White says: "copyright law protects the interest, first and foremost, of the creative community; writers, artists, photographers, musicians, computer programmers, film makers, etc. Whenever a new medium emerges for creative works, this is liable to put pressure on copyright and perhaps bring about amendments to the law".

White continues with a general review of copyright law, and among other matters discusses "collective copyright licensing". This is the area which is at present presenting severe practical difficulties to people involved in multimedia. The basic problem, as White says, is that: "at present a person wishing to use works for a multimedia product has to make an individual approach to each rights owner for permission, and clearly this task can be an enormous one. There are, at the time of writing, no significant mechanisms for the collective licensing of works ... the inconvenience, delay and expense involved in gaining individual licences of so many rights owners is reported to be having an inhibiting effect on the growth of the industry".

G.I. Roth and Claus Sullow from The German National Research Centre for IT, describe their multimedia journal called *Multimedia Forum*. This journal is at present used in-house but there are now a number of electronic journals which are available on the open market. The future of this medium appears to be uncertain at the moment. *Multimedia Forum* uses hypertext links to connect highlighted elements on a page to other pages which expand upon those elements. *Multimedia Forum* is not subjected to the pressures of the open market place and the structure of documents is described by Standard Generalised Markup Language (SGML), allowing the material to "easily be processed in various ways".

The authors continue: "last but not least, there are a number of tools available to the editor ... which include the "Dream Parser" which enables the editor to run an automatic conversion of the pre-structured information items from these sources in order to create SGML documents".

It is not clear what "these sources" are. However in *Multimedia Forum* it seems that it is the editor who is responsible for ensuring that material is converted to SGML format. If "Dream Parser" really does do the job automatically then presumably authors could provide material in SGML as well. This has important implications because if authors are required to submit articles in SGML format without any automatic help, a considerable additional load is imposed upon them.

Christian Guittet describes the operations of "Turning an online database into a multimedia guide". The operation involves extracting data from a bibliographic database, adding sound recordings, photographs and illustrations, and presenting it on a CD-ROM. Several photographs of screen presentation are shown in the article, but they were obviously prepared in different ways; the dot distributions used present a range of different appearances. The way dots are clumped, striated, or screened leaves a lot to be desired. It is interesting that a face can be easily recognised when it is defined by quite a small number of dots. Thus in one illustration, the eyes nose and

mouth of M. Jacques Delors – the features which include most of the information needed for recognition – are defined by an area of only 12 × 12 dots – quite sufficient for identification purposes.

Tudor Grashoff discusses "The pros and cons of producing your own CD-ROM". Grashoff describes numerous functions which make up CD-ROM publishing including product design, data conversion from the source to files from which a CD-ROM can be mastered, and CD-ROM mastering and replication. He says that contracting out the CD mastering currently costs £1200 per disc, whereas if a number of CD-ROMs are being mastered it may be worth buying suitable equipment for do-it-yourself purposes costing about £5000.

Angela Ross expands on "Making your own CD-ROMs – advances in CD recordable technology". She claims that a CD-ROM can be created almost as easily as saving data on a floppy disc. Personal RomMaker software for the Macintosh costs about $13,000.

In regard to adding images to a CD-ROM product, Aline Baeck describes systems where images are displayed with the associated text in "Enhancing information with images; the challenges of integrating text with images in online and CD-ROM products". Unfortunately the article omits important information about compression, the size of compressed images, the number of images of a given size which can be stored, and the rate at which they can be delivered from the CD-ROM. In the part about "current imaging technology" and about "future developments in online imaging products" there is little hard information about the topics just mentioned.

Brian Spear from the U.K. Patent Office compares activities in the U.K. and Japan in an article entitled "Patents and virtual reality". While the U.K. has won 60 Nobel prizes for science and medicine in this century, Japan has won only four. With regard to industrial products, Japan has taken out seven times more patent applications than the U.K. Spear continues with a description of a number of virtual reality patents including head set displays, data gloves, computer games, vehicle modelling and so forth. There appear to be only three patents from British originators.

Isobel Pring, Editor, *Image Technology in European Museums & Art Galleries Database (ITEM)*. Issue 6, November 1993. International Visual Arts Information Network, The Library, Suffolk College, Rope Walk, Ipswich, U.K. 174 pp. ISSN 0961-9259.

The main body of this publication consists of descriptions of a series of products and experimental work, together with the persons and institutions who devised them, their purpose, current status, the equipment required and other details. At least one page is used to describe each project in this way.

This issue of ITEM lists information about projects under development or completed, and updates on earlier items received since the publication of the previous issue (ITEM Issue 5). The projects come from sixteen different countries and may be "available for purchase or viewing", "under development" or "running as pilot projects".

It is obvious from the range of listed projects that multimedia in this one area alone has now got far beyond the experimental stage. The book includes an index to the

dozens of published items which have emerged from these projects, mainly CD-ROMs, and also provides summaries of articles covering this field.

A typical cooperative project, for example, is the Narcisse Art Science CD-ROM produced by a consortium of institutions in France, Portugal, Germany and Switzerland. Narcisse is published on a CD-ROM. The CD-ROM provides access to over 120 masterpieces available in colour with a resolution of 2000 × 3000 pixels with much additional information about each picture. Retrieval of pictures is by keywords. More details about the project are contained in the above review entitled *Museums and Multimedia*.

Several of the more interesting projects will be described.

The image database of the National Museum of Denmark in Copenhagen is published on videodisc. Three discs have been produced so far, containing 160,000 images covering all aspects of Danish history, ethnography and antiques.

A project called the Multimedia Dictionary of Modern and Contemporary Art has been commissioned by a French institution with development partners in England and Spain. It is now being developed and presumably will be available in due course on one or more CD-ROMs. It is a dictionary and reference work covering 20th century art in European collections sponsored with CEC IMPACT program assistance by European publishers of art books.

The Art Loss Register has been commissioned by institutions set up for the purpose in London and New York and includes shareholders such as Sothebys, Christies, Lloyds, etc. The objective is to provide a centralised computer register of stolen works of art to deter art theft, aid the recovery of stolen goods, and to prevent the selling and buying of stolen property. DVI technology is used. One database includes stolen art information, and a second includes information from auctioneers and dealers of "art for sale". The stolen art database will probably need up to 10 Gbytes of storage space. Retrieval is by image matching techniques with fuzzy searching, but no details of this process are given.

Martha E. Williams, Editor, *Annual Review of Information Science & Technology*. Vol. 28. 1993. Published on behalf of the American Society for Information Science by Learned Information Inc., Medford, New Jersey. 1993. 492 pp. ISBN 0 938734 75 X. £65.

I have always enjoyed browsing through *ARIST*. I once wrote a chapter for it and the editorial discipline imposed results in a very professional appearance.

ARIST provides thorough reviews; its references take up an average of 12 pages per chapter. It is a large, diverse, and rich information source. The first volume was published in 1966 and it is a good series to maintain on the shelves for general reference purposes. Some of its chapters are likely to be of special interest to IS&U readers.

The first chapter by Blaise Cronin and Elizabeth Davenport (Indiana University) is about "Social intelligence". The authors say "social intelligence implies taking responsibility for one's actions. It might also describe initiatives by governments and technocrats to promote transparency and accountability". Social intelligence includes the activities of grass roots activists. The authors continue: "given all this,

why should *ARIST* devote a chapter to such an untidy construct?" They reply: "The connections between information science and social intelligence are not difficult to articulate". They then discuss these connections.

Peter Hernon and Charles McClure (Simmons College and Syracuse University) discuss "Electronic U.S. government information; policy issues and directions".

The U.S. electronic government information has a significant impact in many areas, and the authors say that "An incredible range of policy initiatives and proposals confronts the Clinton administration and the 103rd Congress .... How the public and private sectors, especially the computer cable TV, telecommunications, and regional telephone companies will work together to establish this national information infrastructure, is unclear and extremely contentious".

Cheryl Metoyer-Duran discusses gatekeepers, particularly those within ethnic groups in California. She describes a gatekeeper model of information-seeking behaviour and types of gatekeeping activity.

The Chapter by Holley Lange (Colorado State University) is about "Speech synthesis and speech recognition – tomorrow's human-computer interface? Ever since this subject excited attention, "tomorrow" has meant 10 years into the future – quite far enough for the author's over-optimistic predictions to have long been forgotten. Even James Flanagan – one of the world's experts on the subject and noted for cautionary remarks, who she quotes, said in 1992 "single chip computers with power in excess of 1 GigaFlop should be deployed before the year 2000, and the year 2001 may actually see a HAL-like conversational machine". The ten year syndrome is alive and well.

Lange refers to the conclusions of Philip et al. at Queen's University, Belfast, which brings us back to harsh reality: "single-user isolated word speech recognisers can be successfully used in voice interfaces even for complex database systems" but at the same time "speech recognisers are not yet practical for accessing databases". However this does not quite do justice to the capabilities of a voice-recognising typewriter which has recently been launched in the U.K. It must be trained to recognise words spoken separately by a particular user.

The "ten year syndrome" is again supported by Lange's quotation of Philip's prediction: "By the year 2000, speech input and output systems will be as common as the keyboard and screen are today".

In the chapter "Virtual Reality"; Gregory Newby (University of Illinois) says, in his review of the subject that "VR has captured the imagination and interest of scholars and the public alike". Indeed it has – to the point of over-exposure. Newby succeeds in his aim of "baring the reality behind virtual reality through a tour of the past and present". He is at pains to distinguish between "appropriate publications of scholars" and "others riding the tide of popularity but offering little insight into VR's origins and destiny".

Over 200 organisations are engaged in VR projects and Newby concludes "Good work has been done to investigate the ways in which virtual worlds might supplement human existence in the "real" world, and good work will continue to be done".

The topics "Browsing: a multidimensional framework" by Shan-Ju Chang and Ronald Rice (Rutgers University), and "Environmental scanning: acquisition and use of information by managers" by Chun Wei Choo and Ethel Auster (University of

Toronto) seem to overlap. The book's index thinks that browsing and scanning are synonyms; one out of the four entries under "scanning", is "browsing" while two others are to parts of the "browsing" chapter. In regard to the articles, a low level of bibliometric coupling indicates that the authors are in no doubt about their considerable difference.

Chang and Rice believe that browsing has five dimensions – context, behavioral, motivational, cognitive, and resource. The authors discuss a "contextual framework for browsing ... without a better understanding of it, our concept of information-seeking behavior cannot be complete".

"Environmental scanning" means "the acquisition and use of information about events and trends in an organisations' external environment". The authors think that "we should expand our limited knowledge of managers as information users" and "we believe that information science and the information profession have the tools to enhance the depth of environmental scanning by managers".

Maurice Line (Consultant) and Margaret Kinnel (Loughborough University) in their chapter "Human Resource Management in Library & Information Services" say: "Increasing internationalisation, indeed globalisation of some industries, a greater need to be competitive, and dramatic developments in information ... have made it vital for firms to be able to respond to changes rapidly and to cut all their unnecessary costs". They recommend one particular book about libraries by A.B. Veaner (G.K. Hall, Boston) *Academic Librarianship in a transformational age; programs, politics, and personnel.*

"Human resource management has become of greater concern in recent years – largely the result of the libraries recognising the significance of the lessons that can learn from the business sector", say Line and Kinnel. They discuss job satisfaction, participated management, stress and conflict, staff development etc. Another factor discussed is the trend to create "a limited number of more or less permanent employees and peripheral employees – a floating pool (or rather sea because their numbers will be much greater than the core) of workers who are called upon by different bodies at different times to serve particular needs".

Line and Kinnel conclude that "the most important unaddressed issue that has been overlooked concerns the stability of staff and the prospect of permanent employment. These are goals of good management practice, but they can no longer be guaranteed at a time when more redundancies seem inevitable and more and more services of public sector libraries are likely to be contracted out to the private sector. Neither trend seems likely to be temporary".

The last chapter by Jennifer MacDougall (Consultant) and Michael Brittain (University of South Australia) is entitled "Library and information science in the United Kingdom". The authors say that "in contrast to the United States, where LIS has taken place largely at the post graduate level, the predominant emphasis in the U.K. has been on awarding diplomas and then on undergraduate teaching, although in recent years many post graduate diplomas and degrees have been developed".

The authors think that most U.K. LIS departments "have maintained their separate identity and have not been assimilated into other schools or departments as has happened to many in the United States". They stress the importance of the 1985 Transbinary Working Group on Library and Information Studies. The group recom-

mended that LIS departments "be funded for computing equipment on the same basis as computer studies departments rather than as social studies of arts and humanities departments (as had been the case)". Such increased funding has taken place.

As might be expected from a book of this kind, *ARIST* ends with an index of over 50 pages. The index is followed by a key word and author index to *ARIST* volumes 1 to 28.

A.E. Cawkell