News, Trends and Comments

NEWS

1. General

Xerox all-purpose machine

In October 1990. Xerox announced that they would soon be introducing an all-purpose machine to be called "Xenith" embodying computing, copying, printing, scanning, and facsimile, with certain combining and re-distribution facilities.

A discussion about this machine follows later in "Trends and Comments".

The Microcomputer replacement business

According to an article in *Business Week* (November 12th 1990) the used microcomputer business is growing at about 35% per year with annual sales currently at about $2 billion.

A 5-year old machine depreciates to 10% - 30% of its original price. Reconditioned IBM, Compaq, and Apple machines lead the market for used computers.

IBM choose London for its Communication Systems HQ

IBM plans to move its worldwide headquarters for Communication Systems from Somers, New York, to London during 1991.

John Akers the Chairman said that "Today's announcement (December 5th 1990) enables us to capitalize on expanding business opportunities in a unified Europe and around the world, and will help us better understand and meet our customer's networking requirements".

There are over 12,000 employees in the Communication Systems division with development locations at seven sites in the US, and at sites in Hursley, UK; La Gaude, France; Valencia, Spain, and at Rome, Italy. Manufacturing is carried out at eight sites with 2 in the UK and others in France, Japan, the US, Canada, Spain and Italy.

The major activities in this division are Networking based on Systems Network Architecture (SNA), with some work being done on Integrated Services Digital Network (ISDN) systems, Network Management, Voice data products, and the design, implementation, and operation of Value Added Network Services (VANs) for customers.

Multimedia

According to an article in *Electronic World News* (Bernard Cole, pages 36-37, November 19th, 1990) entitled "How the multimedia revolution will bring change to workstations", the workstation environment "will undergo another major change in the next few months... with "Add-in image processing boards" and "boards with a range of video and audio-based multimedia options".

These remarks seem to be made without consideration of the multimedia market. Cawkell (*Critique* 3(3), 1-12, December 1990. Published by Aslib, London) in a review of the topic entitled "Multimedia: hardware, software, costs, and applications" says:- "The Multimedia "end-product" at the present time is usually a "multimedia presentation"".

"Multimedia enhancements seem to add real value in educational and training, and it is in these areas where applications are appearing. Boring old, plain vanilla business or information product providers have not yet acquired the gizmos needed to add the necessary multimedia bezaz (to use some foreign but explicit words). But you don't try and justify the cost of intangibles like your new multimedia fun-image - it's an act of faith".

Cawkell continues "However John Gale (In *Proceedings of the 14th Online Information Meeting*. London. December 1990. Learned Information. Oxford & New Jersey) with an article entitled "Multimedia - how we get from here to there") is prepared to be more definite about the future".

"In 1994 he foresees 18 multimedia applications, 22 "market segments", and 14 "end user platforms". Mind you some of these are rather vague - for instance "documentation" as an application, "consumer" as a market segment, and "computerised entertainment/information systems" as an end user platform".

"The major markets in 1994 (in current millions of dollars) will be Consumer 4337, Heavy Manufacturing 2211, Other 2103, Government 2055, Motion PIctures 1239, Education & Libraries 850, Computer and Information Services 450, and Retail Trades 352. Total $13,597 Million", says Gale".

Are Cole and Gale with their implied or direct "burgeoning market" remarks, likely to be proved correct, and Cawkell (wearing two hats as your IS&U contributor and editor) futures, with his notions of a limited foreseeable market and fun-image, far too conservative? Time will tell all.

2. New Services

Bowker-Saur (UK 071 436 5778) launched its Applied Social Science Index & Abstracts (ASSIA) on DataStar in November 1990. ASSIA covers over 550 English language journals from about 20 different countries.

DataStar (Worldwide marketing UK 071 930 5603, USA & Canada 800 221 7754, Japan 03 463 7181) added 10 new databases in September 1990 - Health Periodicals Database (Aerzte Zeitung Verlagsgesellschaft), Computer Database (Information Access Company), Cad/Cam Abstracts (Bowker Electronic Publishing), Robotics Abstracts (Bowker Electronic Publishing), Recent Advances in Manufacturing (BKT Information Services), French Importers & Exporters (Association Telexport), Austrian Companies (Kreditschutzverband von 1870), daily medical newspaper full text (Aerzte Zeitung Verlagsgesellsschaft), Social Scisearch (ISI), and Applied Social Science Index & Abstracts (Bowker-Saur Ltd).

Derwent (UK 071 242 5823, US 703 790 0400, Japan 03 581 7711) announces (September 1990) "8000 new compounds added to its Standard Drug File with graphics (machine readable file for in-house use). 25,000 new compounds now available". Derwent also describes its new alerting

service "Patents Preview". From October 1st 1990 it will provide abstracts, typically within 1-2 weeks of publication date or receipt by Derwent, in the four subjects Central Nervous System, Immune System, Cancer Chemotherapy and Endocrine System, and Cardiovascular system.

Dialog Europe (UK 0865 730275) announced direct access via BT-Tymnet Global Network Service (GNS) for European customers as from September 1st 1990. GNS has dial-up nodes in Belgium, Denmark, France, Italy, Netherlands, Sweden, Switzerland, UK, and West Germany. The benefit is dial-up without any prior arrangement at a flat rate of $0.20 per minute without any extra per-character charges like those imposed by PTTs.

Excerpta Medica (Europe +31 20 5803 531, US and Canada 212 633 3971, Japan 03 5991 1337) lists changes to its EMTREE controlled vocabulary used to index EMBASE records in its publication PR File 8(2), 1990. For example EMTREE has been expanded with 100 new medical terms and 10,000 new drug terms. EMTREE searches may be conducted on Dialog, Dimdi, Datastar, BRS, and JICST.

Information Access (US 415 378 5206) has added four full text databases on Data-Star (December 1990). 100,000 articles have been added to Computer Database; Health Periodicals Database with special emphasis on "consumer health" (to me, a new idea, whatever it is); Magazine Database covering American current events, trends, and popular culture; Trade & Industry Database, covering trade-specific and general business publications. Information Access also says it has signed an agreement with Comline for the provision of 130 Japanese language publications on industry, technology, and financial markets.

IRS (UK 071 323 7951) has added Hyperline to its services. After typing "Hyperline" the response will be a list of the files where Hyperline runs. In fact it runs on 10 major IRS files and will be gradually extended to more. Hyperline allows for navigation through a thesaurus network, prepares lists of terms linked to documents conceptually related to the one being read, and provides other Hypertext-like functions. IRS lists numerous new databases in a leaflet dated December 1990 including CEDEFOP which covers educational and vocational training, EISD, an engineering and industrial software directory from Engineering Information, MHIDAS covering off-site incidents involving hazardous materials, MIRA, from the Motor Industry Research Association, covering motor vehicle literature, and Spaceflight Data from Space Flight Data Applications.

Japanese bibliographic databases may be accessed by scientists and engineers in the US at no charge as the result of arrangements made between the National Science Foundation and the Japanese MInistry of Education, Science, and Culture. The requester calls the database operator, who will accept requests in English or Japanese, on 202 357 7278. The operator converts the request into search language, searches the database covering literature held in over 1000 universities, and returns the results to the searcher, translated into English as necessary.

Nexis (UK 071 488 9187) lists the hundreds of sources available in its online service (from Mead Data Central) covered mainly as "selected full text" in a list dated December 1990.

In another leaflet Nexis draws attention to its 1990 improvements including coverage of the four major UK newspapers The Daily Telegraph, The Independent, The Financial Times, and The Times, Extel cards online, the CELEX database covering EC regulations, INVESTEXT stockbroker reports, and a Clipping Service performed automatically daily, weekly, or monthly, which "returns the results to your PC".

3. New Products and Publications

AKS (UK 0677 25101) announced version 6.4a of its ASSASSIN system for ICL computers in November 1990 - a part of the new version soon becoming available to all customers. It provides several new features including a "form filling" user enquiry interface, the presentation of documents in an "Action List" for choices such as "display in full", "to be printed" etc., and the easier use of routines for users who want to periodically repeat the same search automatically.

JSA (Jackson Smith Associates UK 0933 311013) announced RefWriter in December 1990, a software package which runs on MS/PC-DOS micros or VAX minis running VMS. RefWriter reformats bibliographic references. "Records in any tagged-field or blocked text can be converted into almost any structured text representation". The package costs £225 and there isa site licence of £1250.

Public Library Watch is a newsletter started in 1990, and published by the Library Research Center, University of Illinois School of Library and Information Science, 410 David Kinley Hall, 1407 W.Gregory Drive, Urbana IL 61801. The publication costs $50 annually for four issues, or comes as part of a membership subscription which includes certain other benefits. The cost of membership is $125 for smaller libraries increasing up to $1250 for the largest. The newsletter monitors and reports the results of research on Non-profit Management, Personnel and Fund Raising, Literacy, Automation, and other areas relevant to the practice of librarianship.

4. New CD-ROM products

Chemdisk covers chemical engineering abstracts compiled by Engineering Information Inc from 1980 to the present, and is published by Dialog (US 800 334 2564).

Drug Information Source covering Pharmaceutical Abstracts with quarterly up-dates, inclusive of a Philips CD-ROM workstation, is published by Microinfo (UK 0420 86848) at £3650 and £1055 for an annual renewal.

The *Guardian* newspaper is published by Chadwyck-Healey (UK 0223 311479). One disc covers news, features, and editorials from one year's 300 issues.

The *Independent* newspaper up-dated quarterly, is now published on CD-ROM by Bowker-Saur (UK 071 436 5778).

Life Sciences Collection covering all years back to 1982 inclusive of a Philips CD-ROM workstation, is published by Microinfo (UK 0420 86848) at £4995 and £860 for an annual renewal.

Lotus One Source (US 1 800 554 5501, UK 0784 455445, Japan 03 436 4105) is the collective name for three discs - CD/Investment - financial information about US and international companies, stocks, and financial issues; CD/Corporate - with an analysis of US and International companies and markets; CD/Banking - providing US banking data. The data from each disc may be analysed using a Lotus 1-2-3 spreadsheet on an associated microcomputer.

Medline covering all years back to 1966 inclusive of a Philips CD-ROM workstation, is published by Microinfo (UK 0420 86848) at £3505 and £1805 for an annual renewal.

World Research Database is published by Microinfo (UK 0420 86848) at an introductory price of £1600 up to March 31st 1991, or £2000 annually,

up-dated by disc replacement. It includes details about over 20,000 research laboratories, over 27,000 biographies of senior researchers, and 49,000 mailing addresses.

TRENDS AND COMMENTS

Software shortcomings.

PC World for October 1990 says that Word Perfect is the market leader in Word Processing, claiming three and one half times the installed base of any of its competitors. It also leads the pack for "user satisfaction" with Microsoft Word and Professional Write coming second and third.

The phrase "least dissatisfied users" would surely be a better phrase unless the users are an incredibly docile lot. Words fail me when it comes to Word Perfect's complexity and ghastly Instruction Manuals. The System defeats even Word Perfect's UK hotline service - and understandably so, although the company employs pleasant, obviously computer-competent people. Several times they have had to call me back with a re-worked solution, having checked that the instructions provided are either wrong or useless.

It's a good thing that the IT technical journals, always ready to reinforce the general hype, also continue to be critical about this point, although the general dissatisfaction does not seem to produce much effect.

In 1989 Kenneth Sheldon (*Byte*, page 344, July 1989) in a piece entitled "Moby Dick 2.1" imagined how the book of that name would have been published had it been a software product. It would have come "wrapped in oilcloth with a long parchment notice explaining when an where you could read it, that you couldn't lend it to anyone, and that the publisher wasn't responsible if anything in the book were to cause damage to your life, liberty, or kidneys... After struggling through the first few chapters, two thirds of the readers would realize that they had no idea what it was about".

Shortly before Sheldon's article, *Byte* published "Is Bigger Better" by Ezra Shapiro (pps 125-128, July 1989). He says:- "the feature wars have created programs that can be pretty daunting to the neophyte". Having praised the undoubted ingenuity of a WP and design package called "More II", Shapiro wanted to use it to "cobble up a little outline". However he likened this supposedly simple exercise with "using low-yield nuclear weapons to rid your house of termites. The screen is awash with teeny cryptic symbols. Endless menus lead to endless sub-menus".

Professor Thimbleby, IT Professor at Stirling University says (*New Scientist* pps 84-85, December 2nd 1989) about his Word Processor:- "Quantity - integrated do-anything packages - rather than quality, is the rule... in legalistic terms the software warranty will effectively say "you've paid the money, now don't bother us"".

According to Virgo (*Daily Telegraph*, December 17th 1990), after over 100 copies of a medical records system had been installed, the UK National Computing Centre revealed that it could not be re-started in the event of a power cut. The battery backup provided was incorrectly wired and had never been tested (actually, this is of course, a hardware not a software fault).

John Boddie (*Byte*, page 374, May 1990) has a different kind of gripe which he calls the "Update Syndrome". This is about "software updates and people who are afflicted by them". He says "I've just moved up to version 4 of Microsoft Word for the Mac. It doesn't give me any major

benefit over version 3.02 for the things I do, but I can't shake the feeling that if I call up next January with a problem with 3.02 I'll find out that support is available for version 4 only".

It would be naive to expect that the comments quoted above and many others like them will have any effect. 25 new features in the sales literature will have a far greater effect on sales than remarks like "user friendly", or "excellent instruction manuals provided". Even if such remarks were true nobody would believe them.

The Xerox Xenith/Docutech strategy

Xerox's brilliant team at Palo Alto gave rise to products which were not accompanied by brilliant marketing. Xerox are now marshalling their reprographic experience to generate a product range which they are hoping will do better. Perhaps their new ideas were stimulated by a chat with ex-PARC researchers Charles Geschke and John Warnock, founders of Adobe and inventors of Postscript. Anyway there has been some kind of collaboration with Adobe.

An announcement about a stand-alone machine called Xenith appeared in the *Wall Street Journal* of September 20th 1990. The machine was later re-named the Docutech Product Publisher (DPP). Evidently this is the first of a range of machines, or a machine which is "easily" up-gradeable. The strategy calls for a variety of inputs to follow the single input method provided with the first machine.

The word "easily" needs to be within quotes because hardware/ software upgrades are notoriously bad. They rarely work without hassles and the documentation is rarely/never tested on users before release – a procedure which is, in my view, essential.

The first DPP will cost £140,000 in the UK and will be marketed to printing houses and large in-house print-shops. It will accept one type of input only by means of its on-board scanner. However the scanning rate will be 24 A4 pages per minute at 600 dots per inch (dpi)– and that is fast by any standards – very fast.

Cognoscenti will know that two questions then need to be asked for which answers probably will not appear in the sales blurb:– "what kind of pages with what kind of contents?". In this case the answers somewhat reduce the impressiveness of the claims. The pages are "pristine A4 sheets" and "contents as for CCITT test page number 1".

This means that assorted "used" pages on different grades of paper with non-pristine edges or corners certainly will not be mechanically manageable at this rate. CCITT page number one is the "Slerexe" short business letter. Its contents are much more easily processed than most pages and easily compressed since the test letter consists mainly of white space. But even if the scanner does 5 pristine pages per minute at 600 dots per inch this is still very fast.

Each page will be displayable, and comprehensive "cutting and pasting" facilities will be provided for page re-formatting and composition. 1.2 Gbytes of storage will be available which means that about 2700 600-dpi pages can be stored assuming an average 10.1 compression ratio which is likely to be the average achievable. A 600 dpi black-and-white A4 page contains about 4.4 Mbytes uncompressed.

The machine will potentially output at 120 Mbps or 8 Mbytes/sec., and the claimed printing rate at 135 pages per minute almost matches this. This is 135 *different* pages – not to be confused with the specification provided with laser printers where the page rate is usually given without saying that it means the rate for repeatedly printing the same page.

The first upgrade will consist of an add-on server/driver in the form of a microcomputer with a 30386 CPU. The micro will accept input in the Postscript, Interpress, or HP PCL languages. In spite of the rapid growth of Postscript, Hewlett Packard PCL remains the most widely used Printer Control Language. Consequently pages composed on most Desktop Publishing systems will be accepted. The micro outputs to the DPP in a form ready for page re-composition.

The micro also embodies Novell Netware software to enable the DPP to be used as a networked publisher. This means that pages from machines on a Local Area Network (LAN) to which the DPP's micro is connected will be accepted at typical LAN rates of around 10 Mbps or 1.25 Mbytes/sec - about one 600 dpi A4 page every 4 seconds.

Gems from the Literature

Curious articles continue to be brought to my attention via Information Services. I listed a few of them in the December 1986 issue of the Institute of Information Scientist's publication *Inform*. Included was a piece from Mr. L. Ong (now believed to be known as "Mr. Pong" by his colleagues at the University of Singapore) in *J. Environmental Management* entitled "Least cost activated-sludge design using a microcomputer".

This odiferous topic has just received another airing - sorry about the choice of words - expertly reduced to a lower pong-level - in an article entitled "Testing an expert system for activated sludge process control". It was by W.J. Lai who works at AT&T Bell Labs. It appeared in the *Journal of Environmental Engineering* for Sept/Oct 1990. Why are Bell messing about in this murky area?

Pigs tend to linger about in the murk, but here's a squeaky-clean piggy:- "TEP - the electronic pig - a prototype of a knowledge based computer system for swineherd health" (M.L.Vos et al in *Preventive Veterinary Medicine*, July 1990). What will they think of next?

The following article must have established some kind of a record, title-wise:- "Phase equilibria and structural chemistry in the ternary systems Al-Si-N, Cu-Si-N, Zn-Si-N, Ag-Si-N, Cd-Si-N, In-Si-N, Sn-Si-N, Sb-Si-N, Au-S-N, Tl-Si-N, Pb-Si-N, Bi-S-N, Al-B-N, Cu-B-N, Zn-B-N, Ag-B-N, Cd-B-N, In-B-N, Sn-B-N, Sb-B-N, Au-B-N, Ti-B-N, Pb-B-N, Bi-B-N." Messrs Weitzer, Remshnig, Schuster, and Rogi, whose names were concocted by cobbling together randomly chosen symbols from the periodic table, published it in the *Journal of Material Research* 5(10), 1990.

Highly specific titles of this kind are counter-balanced by articles which use unspecific words. Say you were interested in all manner of bygones and decided to use the string synonym "Antique/" in an online search. What would you learn from the piece by Mr R.C. Plumb, who published it in - of all places - The *Journal of Chemical Education* for December 1989? The title is "Antique windowpanes and the flow of supercooled liquids". How to crack antique glass perhaps?

Happy Mr. Richard Beaubien writes about "The joy of urban traffic engineering" in the March 1990 issue of the *ITE Journal*. The other day I got stuck on London's notorious M25 ring road for an hour - I've never felt more miserable.

To end this short tour round the world of improbable titles consider these two:-"Do females turn males on and off in Barnacle Goose social displays?" (M. Hausberg et al in *Ethology*, March 1990) and "Educating air-force mortuary officers" (S.D. Rosenbaum et al in *Death Studies* 14(2), 1990). In response to the first, I can only suggest "ask a male Barnacle Goose". With regard to the second I understand that well-

qualified officers in this field are addressed, for instance, as "Squadron Leader Mortician Bloggs" or even as "Air Vice-Marshall Mortician Hearse" when they progress to the higher echelons.

Noted in the Online 90 Proceedings

The Online meeting, as judged by *"Proceedings of the 14th Online Information Meeting*. London. December 1990. Learned Information. Oxford & New Jersey", was more interesting than last year. Unfortunately space only allows me to pick out a few items.

CD-ROM and Online current awareness.

In *"The ideal CD-ROM workstation for the 1990s"*, Peter Jacso (University of Hawaii) remarks:- "always think of the monitor and video control card as a unit... there is no point in buying a card capable of higher quality than your monitor can produce. It may even cause damage to your monitor".

"Hitachi (also under the alias Amdek) players are supported by every CD-ROM product. Philips and Sony are the next most frequently supported; other brands enjoy markedly less support".

Terry Hanson (Portsmouth Polytechnic) in *"The electronic current awareness service and the use of Pro-Cite at Portsmouth Polytechnic"* describes how he manages a combination of systems in order to provide his clients with the best possible service.

"The situation is getting better all the time... as publishers... offer download formats from the databases which are directly compatible with the software packages... The principal example of this practice so far is the deal between the Institute for Scientific Information (ISI) and Personal Bibliographic Software (PBS) the makers of Pro-Cite. The result is that records can be taken from the ISI CD-ROM products and their Current Contents on Diskette products and inported directly into Pro-Cite with the minimum of fuss".

"There are very good reasons for encouraging the use of Pro-Cite by both students and administrative staff... it seems reasonable to envisage a scenario whereby students create and maintain their own Pro-Cite databases".

Hanson continues:- "The main databases used in the Electronic Current Awareness Service (ECAS) are the five Current Contents on Diskette products. They are published weekly and in most cases are searched weekly... With the CD-ROM services much depends on the frequency of update... At a time when many librarians fear that the various new information technologies are about to marginalise them, this paper shows a positive way of embracing the technology on behalf of the user community and enhancing the status of the library in the process".

Capturing Graphics.

D.Menella and A.Muller (Science Applications Corp) cover a very important subject in *"Data capture of compound documents: solutions to problems"*. "Documents easily converted to searchable text are rare. These "perfect" documents are those which contain sharp, legible, text positioned squarely on 8.5 x 11 inch pages with no graphics, tables, formulae, columned text or handwriting".

True, but unfortunately the solutions offered are poor. With regard to graphics "Our decision was to preserve graphic captions... Our solution was to insert those captions that interfered with text proximity at the end of a convenient section or paragraph. All other captions were left where they occurred". This is 1990 so I would have expected some discussion about "mixed mode" coding so that graphics could be included.

Television inter-collegiate links.

A.Buxton et al tell us about "*The use of LIVENET for online education and training*". Livenet is a 4-channel TV-bandwidth fibreoptic link between five teaching and research sites in London, plus a 2 Mbps data channel "Intended to increase intercollegiate collaboration and sharing of resources. Anything visual - people, notes or handouts, slides, graphs, demonstrations, microscope objects and computer screens, and anything audible are equally accessible to all participants. Students at each site can not only watch lectures but ask questions and participate in discussions without having to travel between campuses".

The library staff have used the system for online demonstrations and other presentations. Buxton et al., conclude:- "We are optimistic about the application of LIVENET in many areas of information retrieval including online searching".

The European information industry.

In "*Restructuring the European information industry*", David Worlock (EURIPA) says "The major market research companies who surveyed the Western Europe information marketplace produced 1988 market size figures which range between $1.777M and $2.055M... The EIIA survey gives a value of $2.778M for the output of European hosts and systems providers in 1988".

Worlock continues:- "Demand reduction of Western European economies has started to bite... marginal publishers may be squeezed out and the pressure on advertising looks serious enough to encourage family holdings to realise their assets... The creation of the European Single Market after 1992... does encourage major groups in Europe, the USA, and Japan, to reconsider their strategic positioning... Publishers faced with world market concerns have seen the possibility that Europe may, at least for a little while, become a more difficult and possibly even slightly protectionist marketplace until problems of single market integration have been sorted out".

"The Return from the West Syndrome... the mid-1980s, it is argued, saw European publishing interest in the USA at its height. Almost all major European groups (including MCC, Hachette, Bertelsman, Elsevier, and Wolters-Kluwer, amongst many) bought strongly and seriously in the US at prices which sometimes shocked the US industry and generally raised price expectations in the US information industry acquisition marketplace. It is argued that many of these players have satisifed their strategic positions... there could therefore be a reasonable expectation that attention may return to the European field of activity with the major European players looking seriously at their own back yard".

Image Databases.

Anjali Chaudhry and Arup Roy (CMC Ltd., India) describe a serious attempt to set up an image database in "*Art records treasury system: picture retrieval through image databases*". The system is based on an IBM 4361 mainframe in Bombay and covers CMC's own art collection. It may be accessed by other CMC offices via the SNA INDONET public computer network which is managed by CMC, and by CMC's London office via an international gateway packet switch.

Photographs of art objects are captured using the Eikonix 850 series 4000 x 4000 pixel CCD true colour camera. Storage is on a CDC/Philips 2 Gbyte optical disc capable of storing up to 3000 uncompressed colour pictures. For display purposes an EGA video board in a micro, operating at 12M pixels/second and using 32 bit planes, drives a Mitsubishi C3905 L9ADK 512 x 512 pixel colour monitor.

The retrieval arrangements have been developed using Oracle

RDBMS with SQL and a 4GL interface with display routines written in C. Details are provided of the various attributes of an image which are normally input, but interest centres on the "Picture Table" which presumably enables a picture to be retrieved via a description of its contents. The Picture Table contains "Details of all pictures of an object. There is no limit for the number of pictures that can be stored for each object".

Unfortunately nothing is said about the ability of a user to retrieve an image by asking questions which are effectively acted upon according to the data contained in the picture table. The contents of the Chaudhry article lead me to believe that the authors are engrossed in a most interesting technology and are involved in a fascinating technical exercise using a state-of-the-art system. If the retrieval effectiveness turns out to be as impressive as the equipment, they will have made a real breakthrough. For the time being I remain sceptical.

Kuwait.

In a cri de coeur *"The impact of the Gulf crisis on business information"*, Shawky Salem tells us about the effects of the invasion on the substantial information complex in his country:- "The Kuwaiti market in computer investment has been lost... hardware and software removed to Iraq will be useless as they require special expertise... computer spares and maintenance are not available now in Kuwait". However "There will be a thriving market at the end of the crisis and a good market to replace the systems which were lost, stolen, or damaged".