

## Book reviews

Reading maketh a full man; conference  
a ready man; and writing an exact man

Some books are to be tasted, others to be swallowed  
and some few to be chewed and digested

Francis Bacon

As a philosopher and scientist, Sir Francis Bacon appreciated books. Bacon was an experimenter. He is said to have died in 1626 of a cold caught while trying to discover more about the preservative effectiveness of snow by stuffing a fowl with it. Tasted, swallowed, or chewed, I only review a few of the large number of books which I receive – those which I think you might find interesting or useful for reference purposes. I do not review very specialised books and I set aside those which do not appeal. Do not read these reviews if you wish to know about books to avoid.

The price per page for the kind of books reviewed here varies from about 5 p (7.5 cents) to £4 (\$6); that made me think about value for money – the binding and number of pages must have something to do with it. How do you judge when a book is good value for money? Are books always priced at what the publisher thinks the market can bear? How elastic are book prices – if you doubled the price of a particular book, how would that effect the demand? What are the economics of compiling and selling a report at, say, £1500? These are but a few of the questions that could be asked, so I think the wisest course is to list the price without comment.

However, if you do not value your interest at £1500 how can you see an expensive publication? Most people know that under Section 15 of the 1911 Copyright Act one copy of all UK publications must be deposited with the British Library. A “publication” in this case, by the way, is “anything printed and distributed to the public”. If you publish and distribute in the UK a two page leaflet on “Where to buy turbo-encabulators” you should send a copy to the BL within four weeks of publication. The definition of a “publication” is currently being considered by the Department of National Heritage.

UK publishers are not obliged to deposit a copy at, for instance, the Library of Congress, nor in any other foreign library, so the only place for consulting a UK publication which you do not wish to buy or are unable to borrow is at the British Library, probably somewhere within 25, Southampton Buildings (off Holborn) in London.

**Megamedia Shakeout**, Kevin Maney, John Wiley, New York and Chichester, 1995, ISBN 0471 10719 0, 358 pp., £19.99.

This book contains one chapter about the possibilities of a future “fused into one” Compuphonavigation set for the information superhighway, but discounts it in favour of improved versions of existing

machines. This is as far as it goes into the mechanics. The book is about the “big egos” in the “megamedia industry”.

Kevin Maney is a reporter for the *Money* section of *USA Today* – a column which appears in a number of newspapers in the United States. He interviewed many of the chief executives of what he calls “Megamedia Companies”, and the impressions gained coupled with a review of the activities of each company form the major part of the book.

Maney says “Whole industries are betting their futures on the new wave”. The “new wave” is “megamedia”. He does not like names like “communacopia” (“sounds more like a sexually transmitted disease”) or the “information superhighway... megamedia is easier to say”.

Maney’s justification for a “new wave” is based on his observation of interactions between people in the Telephone, Cable-TV, Entertainment, Long Distance Telecommunication, Software, Computer, and Television companies. He thinks that “Strong leadership and vision seem to be keys to success in megamedia”. He “paints colorful pictures” of the Chief Executives, saying “Why emphasize character? It’s the only way to get a handle on who in megamedia might win and who might lose through the next decade.” He thinks that Wall Street’s focus on the next quarter, and success as judged by the price of a company’s stock is inadequate.

The resources and people of the United States are conducive to the evolution of big companies and big people. The development of megamedia requires plenty of risk-taking and the generation of colossal hype. Talking up the topic loudly enough moves it along faster and most people like to believe it. A lot of confidence goes a long way.

This is a novel way of examining superhighway developments. Business personalities in Europe usually only get a mention in places like the Financial Times. They hit the popular press headlines as bosses unworthy of unearned rewards gained from stock options, or when they are associated with a scandal considered to be “news”.

Maney emphasises the personalities of Chief Executive Officers (CEOs) as success indicators but we do not know anything about the permanence of these men or what might be the effects produced by the new brooms who might succeed them. How confident would the CEOs of Thinking Machines, KSR, Commodore, Inmos, Sinclair, Nexos, etc., in their heydays have been if they had been interviewed? Probably just as confident as their opposite numbers in the States.

The author’s starting point for his two years of “companies gone mad... events happening in a thunderclap” is the prediction in November 1992 by John Sculley, Apple’s chairman, that by 2001 the global megamedia industry would be worth \$3.5 trillion – i.e., 3.5 million million dollars.

Sculley “sat next to Hilary when Clinton made his first speech to Congress”. “He called on the Clinton Administration to set a farsighted goal for the superhighway’s construction in the way President Kennedy had challenged the country to put a man on the moon.”

A major breakthrough came in August 1993 when a court in Virginia ruled for Bell Atlantic who wanted to operate a cable-TV network. The eight Belco telephone companies, spun off when AT&T was broken up in 1984, were prevented from such operations by the 1984 Cable Act. Soon after this important decision, a deal was struck between John Malone, CEO of Telecommunications Inc., the country’s biggest Cable-TV company, and Ray Smith, Bell Atlantic’s CEO. They agreed to merge the two companies creating a \$33 billion entity. They would provide interactive 500-channel TV and two-way video communications.

The deal fizzled out later for various reasons but that did not affect the general momentum. “No set of companies ever changed so much, so fast” says Maney. Southwestern Bell took over two cable

networks in Washington D.C. and paid \$650M for them. U.S. West (another Belco) offered \$2.5 billion for 25% of the Time Warner cable system, and so on.

The major divisions of the U.S. megamedia industry consist of AT&T and the eight Belcos, four big cable-TV companies, which also run most of the UK cable-TV franchises, six major information/entertainment companies, and about eight general technical companies.

These big players obviously believe that megamedia success will come if they possess technical know-how, together with telecom networks and the material to send along them. If you want the material, you take over the company that produces it together with its copyright, or you set up some kind of joint operation. Thus Sony owns Columbia/Tristar who have a library of 3400 films and 25,000 TV episodes, Disney and Telecommunications Inc., have an agreement for a new compressed digital-cable TV channel called *Starz*, running until 2004 for access to Disney movies, and IBM and Sears offer the Prodigy home shopping service.

Maney's winners are Comcast, Compaq, General Magic, Hewlett-Packard and Viacom. The losers will be Belco Pacific Telesis, Sprint, DirectTV, Apple and QVC.

Incidentally, there has been no let-up in the convergence and merger trend. In October 1995, Time-Warner took control of Turner Broadcasting with an investment of \$5 billion. Turner possesses the world's largest library of films and animations, claiming to own three times as many cartoons as Disney; it also runs the CNN news services. Its largest single earner is probably the movie *Gone With The Wind* which has so far earned over \$3 billion. Ted Turner retains an interest in the company.

In November 1995 Michael Jackson sold his ATV Music, which includes Presley, Little Richard, and Beatles songs, to Sony for \$90 million. Sony's music division is now worth well over \$450 million.

Maney could not be mistaken for an Englishman, a Frenchman, or a German. His major conclusion is that "The United States will kick butt... U.S. companies are so far ahead it's not even funny", he says. "American phone companies are far more competitive than any others in the world... the United States is unequalled in producing content – films from Hollywood, research databases, games, CD-ROMs..."

"Megamedia will create powerful worldwide demand for America's technology and software. The potential for international growth for U.S. megamedia company is phenomenal. Every inch of megamedia will be dominated by U.S. companies", claims Maney.

American businessmen appear to be convinced that the information superhighway is in sight and are preparing for it by investing heavily. How long will it be before enough of it is in place for them to get a return on their investment? Will the hype of the early nineties be seen to be justified by its arrival sooner than expected?

People accept revolutions slowly. If and when Megamedia arrives it will rank with Kondratieff's 50 year cycles – steam, cars, electricity, etc. What will be the effect on European culture? Will Europe become a major entertainment and information provider, thereby softening the impact? Who dares to make any forecasts? Not I, for one.

**Info-Rich Info-Poor**, Trevor Haywood, Bowker-Saur, East Grinstead, England, 1995, ISBN 0 86291 631 3, 274 pp., £35.

This book should be read after you have read Maney's book reviewed above. Both contain political statements but Maney's are not spelled out. Haywood, on the other hand, is expounding his political viewpoints in the second part of his book.

Trevor Haywood is a Professor at the University of Central England, Birmingham. The first half of the book is about certain characteristics of information, with chapters entitled: "The Information-Knowledge Chain", "Information Moments" and "The Knowledge Surplus".

"Information Moments... cumulate in rich and varied information acquisition journeys... the simple taxonomy of accident, trial and error and structured learning is designed to identify the building blocks that continuously slot together during human information acquisition."

In "The Knowledge Surplus" Haywood has a little dig at the observations of Machlup, Bell, Porat and the like, who "were claiming that information and the production of knowledge is replacing labour as the main ingredient of all work, and that it has become the key motor for all future economic success... serious academic thought was being given to whether a gas fitter's work was purely informational in character or just information intensive...", he writes.

The second part of the book includes chapters entitled "Information and Cultural Context" and "Information Concentration: More or Less?". This part deals with the downside of Maney's megamedia industry which is characterised by American energy, confidence, and optimism. In Haywood's opinion, megamedia trends of the kind described by Maney are mainly bad. The supply of information in pursuit of profit is bad. The paradox, says Haywood, is that "information poverty coexists alongside the extreme richness of information infrastructures..."

Haywood's thesis is that "the opportunities access to information have never been, and are unlikely to be, distributed evenly among the members of any community, rich or poor, large or small".

"Telephone companies, publishers, movie studios, cable operators, computer manufacturers and television companies are all now jostling to see who fits, who is available, and, just as importantly, who might be denied to another suitor. They are seeking to secure control of all the components of creating, owning, distributing and recycling information. They want ownership of every genre and every medium..."

In describing the activities of Pearson, Haywood says "The phrase 'seeking to be the market leader' occurs with monotonous regularity in the world of media concentration. Although it can mean 'we intend to offer the very best', it can also be read as 'determined to use whatever muscle we have to crowd out the competition'".

But *The Guardian*, frequently quoted, "... retains respect and strength from its unique place within a hands-off trusteeship... the trust continues to insulate its newspapers from the cruder pressures of short term commercialism".

I have tried to find something in praise of the information world, and praise is occasionally given. Chadwyck Healey's CD version of the *English Poetry Full-Text Database* is "an indispensable research tool for scholars". But the praise is negated in the next sentence: "But most of us are not scholars, our information needs are less well defined and we will not be able to afford computers, software, and modems".

In the concluding chapter Haywood returns to "The Information Moment", suggesting that it is "now likely to occur in the home, mediated by information which is increasingly owned by the owner of the distribution system. Providers will increasingly confuse our shortage of disposable time with poor attention span. Armed with this mistake, and seeking faster returns for every unit of information time, the media conglomerates will squeeze more and more into smaller and more digestible packets, arresting our attention with short, sharp, information moments, supported by sensational sounds and pictures."

“One outcome of this brevity is that our concept of ‘serious’ is nearly always being reviewed downwards. Issues such as war and invasion are either ignored or sanitized into drama by presentations that have only space for headlines.”

Unfortunately Haywood, ever the idealist, can only suggest ways of changing what he calls this “grim scenario” painted by the *Guardian*. The paper was responding to the “‘there is no such thing as society’ attitude then being sponsored by Mrs. Thatcher”. Within it, “it was becoming easy to trivialize or deny any form of community investment”.

The remedy is up to the people who “change people’s lives every day simply by revealing and sharing what they know... all of us need to ask ourselves on a daily basis what we are doing to make someone else info-rich”. But what would be the flavour of the information when it is imparted by Haywood compared with the flavour of the information imparted by Maney?

**The International Multimedia Yearbook 1995–1996**, edited by Jim Ayre, Jane Calaghan and Signe Hoffos, Fitzroy Dearborn, London and Chicago, 1995, ISBN 1 884964 39 7, 955 pp., £115.

This strongly bound book is priced at about 12 p (18 cents) per page, so in purely physical terms you get a lot for your money. So you do in intellectual terms. An interesting question is “can you do without the technical stuff if you want to get to grips with multimedia?”. The answer is, of course, that it depends on who you are. It seems to me that if you are, for example, authoring a CD-I, you need to know quite a lot about what is technically realisable. But if you want to use the authored product on a CD-I drive you need to know very little. You will not find much in-depth information about the technology here. But what there is would probably be enough for most users.

The first 200 pages are entitled “Introduction”, “Interviews”, “Market Focus”, “Publishing Issues”, “National Profiles”, “Technology Focus”, and “Special Report – The Information Highway”. About 400 pages of “Company Profiles” follow. A 140 page list of offices and distributors ordered by country comes next, then about 100 pages of “Products” ordered by type – e.g., “Authoring & Presentation”, “Photo CD”, “Workstations”, etc. This is followed by a 14 page bibliography of books and journals, a 13 page glossary, 8 pages of product names cross-referenced to the “Products Section”, and finally “Product Names” ordered by manufacturer.

The “Interviews” are in the form of questions answered by Senior Executives of selected companies. There are some interesting replies. For example, in response to a question about the status of Apple machines as a multimedia development platform, the reply was that two thirds of all development is done on Apples. Dataquest estimate that Apple accounts for 63% of development platforms – both are impressive figures.

IBM make points about their involvement with interactive television trials – namely with Bell Atlantic in Alexandria, Virginia, with Hong Kong Telecom using ADSL, with Cox Cable in Omaha, and with Videotron in Quebec.

Macromedia, one of the best known authoring companies, confirm that the Apple Mac is the *de facto* standard for authoring. Macromedia’s Director for Windows can be authored on a Mac and the associated application delivered for a Windows PC or a consumer player like 3DO.

The interviewer put the Philips media manager under pressure in regard to the success of CD-I – suggesting that magazine editors believe that CD-I is “dead in the water”. Philips came back strongly, pointing out that at \$299 a basic CD-I player is backed by a wide range of software; many titles have

sold more than 50,000 copies. Philips thinks that there is a shortage of entertainment software on CD-ROMs.

In the following sections there are some differences of opinion about what is and what is not multimedia and about its success. Thus in "The Economics of Multimedia Publishing", an analyst from Simba, Tom O'Reilly, says that multimedia has "inspired some of the best creative and technical minds of our age" and "has captured the minds of the public... and continues to gain momentum". O'Reilly claims that there will be an installed base of over 25 million multimedia-capable personal computers by the end of 1995.

However, Claire Bayard-White, multimedia correspondent, says "Multimedia is a useless word. It does not describe anything, much less the almost manic and varied activity of a host of diverse industries and companies... in the UK, as elsewhere, their language is impenetrable and they do not communicate with each other, never mind the rest of us". Even so, "... all did uncommonly well in 1994". But Bayard-White's discussion about multimedia applications is confined to CDs.

John Barker, editor of *Inside Multimedia*, says that "I promised you last year that the multimedia millennium had finally arrived. Er, well, yes... but a fat lot of good it did many of the pioneers... the problem was that they had begun to believe their own press releases". The brief review which follows about "a zero billion dollar industry" shows that for Barker as well, Multimedia is simply CDs.

The "Special Report" about "The Information Highway" by Rockley Miller and John Latta from Future Systems does its best to cover this topic in five pages, and it does it quite well. It identifies telecommunication-related markets as being worth about \$280 billion, and that includes telephone systems, equipment, broadcasters, cable, information services and wireless. Telephones account for \$168 billion and information services \$13.6 billion.

"Company Profiles" – by far the largest section – covers over 2000 companies. It provides company details and briefly lists activities and products. Later sections cover products classified under different headings.

It is always easy to criticise glossaries – the first couple of pages do not include Acrobat, ANSI, ASIC, or Blob – but this one is reasonably comprehensive – it must contain at least 500 terms.

To conclude, the enormous amount of information contained in this book obviously makes it a "must" for anyone who is seriously interested in multimedia. In view of the pervasive nature of the topic, if it is not available in all companies, libraries, and educational organisations purporting to cover today's major activities, then that would be a serious omission.

**Network Europe and the Information Society** (anon), A Federal Trust report, Published by The Federal Trust, 158, Buckingham Palace Rd., London SW1W 9TR, ISBN 0901573485, 125 pp., £12.95.

The Federal Trust, founded in 1945, studies and teaches about the future of democratic unity between states and peoples. In a foreword, Lord Cockfield, the Chairman and a former European Commissioner, says that the book starts with an introduction to the Information Society and Information Superhighway for the "critical lay reader". The following chapters are entitled "The Information Vision", and "Towards Network Europe" covering EC attempts to encourage networks and services.

The later chapters are about "a small number of subjects of critical importance". They are about Competition and Regulation, Public Policy, Standards, and Funding the European Superhighway. Each

chapter forms a compact summary of progress and future hopes. There is no index and a moderate number of references.

The benefits claimed for “building the information network and promoting its use throughout society” are:

- Providing the physical infrastructure for a single market.
- Enabling businesses to become more competitive and productive.
- Providing better facilities for public administration.
- Creating jobs – perhaps 10 million.
- Assisting in the integration of central and eastern Europe.
- Empowering better educated and informed citizens to improve their lives.

A great deal of information about European attempts to achieve “beneficial consequences” are to be found here in one place. Apart from the value of possessing a book containing packed-down information and viewpoints about these important topics, it contains a number of specific points of interest.

It considers that the bandwidth of the highway should be capable of supporting a bit rate of 500 Mbps. That would make it possible to download the contents of a five gigabit CD-ROM in ten seconds. This is a curious and unique way of defining the requirements for “an information era... where every home, office, medical facility, school... can access... text, pictures (still or moving), data, and sounds... and to communicate in any or all of these formats”. This rate is a most ambitious and costly requirement. After all, a  $768 \times 1280$  pixel high resolution compressed HDTV picture requires only up to about 30 Mbps [1].

The rate of progress made in Europe reflects the diversity of its numerous countries and the serious problem of changing monopolistic telecom organisations, often against the wishes of powerful vested interests. It took a long time in the UK where the attitude was “why rock the boat and create unemployment?”. This book is critical about “member states clinging to their national champions” and says “harmonisation of standards was painfully slow”.

In the chapter covering competition and regulation the Trust says: “Competition authorities need to ensure that new alliances contribute to choice and market opening and do not create undue dominance”, but the Union’s attempt to impose “Open Networks” has been “largely ineffective” and has “led to widely publicised litigation about breaches of the rules, notable by Mercury against BT”.

The book is somewhat ambiguous over the “American” versus “European” network protocol argument. It considers that both TCP/IP and OSI are “viable solutions” although they stem from “radically different cultures”. However, “The work of the Internet Engineering Task Force... is particularly important in defining the standards of the TCP/IP Internet protocol for this and the next generation”. No comment is made about OSI, so perhaps the Trust is recognizing the inevitable.

The chapter about “Funding the European Superhighway” is particularly interesting. Figures for funding the installation of a fibre network in countries like France, Germany, or the UK are in the \$20 to \$30 billion range. Another figure of Ecu 333 billion (or about \$277 billion) is given for all homes and businesses in the EU. Taking the latter figure and a time span of 20 years, the dollar rate per annum would be about \$14 billion – a daunting investment amounting to up to 50% of the annual capital expenditure of telecom operators.

Such an investment would need to be justified by demand, but, says the Trust, in a masterly understatement: “... it has to be admitted that the consumer market’s immediate receptivity to an integrated mass scale interactive multimedia network remains unclear”. After a review of the prospects

of private, public and joint funding and/or support from the European Investment Bank (EIB), the chapter ends with “the financial instruments of the European Union are likely to play a substantial role in the future development of Network Europe, both by providing or guaranteeing credit facilities for strategic projects, or by financing through grant-aid the development of new applications and services”.

The Trust points out that the EIB lent ECU 85 billion in 1990–1994. Being a “Triple A borrower” and a non-profit organisation, it “can provide the lowest cost of funding to borrowers”.

In the last chapter, “Conclusions”, the Trust prefaces its remarks about the beneficial consequences listed above with: “The European Union must adapt accordingly to make Network Europe a reality”. This reviewer, for one, heartily agrees.

## References

- [1] W.F. Schreiber, *Proc. IEEE* 83(6) (June, 1995), 958–981.

**Applications for the Superhighway**, John Moroney and John Mathews, Ovum Reports, Published by Ovum Ltd., 1 Mortimer St., London W1N 7RH, ISBN 1 898972 35 4, 354 pp., £1495.

This report is almost certainly the most thorough and authoritative review of the subject available at present.

The report contains the following sections:

- Management summary;
- What is the Superhighway?;
- Users and applications;
- Technology issues;
- Regulation;
- The role of network operators;
- The role of other market players;
- Strategies for market development;
- Market forecasts;
- Profiles;
- Glossary;
- List of figures.

It is fortunate that it was available to be reviewed here since all the reviewed books (except the last one which follows this one) present different points of view about the same topic, appropriately christened “Megamedia” by Kevin Maney.

Nathan Rothschild received news about the outcome of the battle of Waterloo well before anyone else in London, thanks to an efficient information network based on fast ships and carrier pigeons. To illustrate the value of rapid information the authors recount how Rothschild sold heavily on the stock exchange implying that he had received news of a defeat. When others followed he bought at the bottom of the market and made a fortune later by reselling when the official news arrived.

Ovum forecasts that revenues from a latter-day information network – the Information Superhighway – will total \$185 billion per annum by 2005. It believes that there will be three waves – the first using



the PSTN at up to 38.8 Kbps, the second, growing from 1997 onwards, using the ISDN at 64 Kbps, the third, growing from 1998 onwards, using broadband at 1.5 Mbps and above.

Applications will be for commercial, domestic, educational, governmental, and health purposes. "Driving" applications "which users are demonstrably able to pay for", will be followed by "passenger" applications. "It is unlikely that any single application will justify the development of the superhighway". In other words, there will be no "killer" applications.

The major obstacles will be the need for an adequate regulatory framework, the development of suitable home terminals, agreeing upon standards, and the development of adequate security.

Driving applications earning substantial revenue are expected to be business information, pictures of museum objects, expert advice, encyclopaedic information, software, and entertainment.

It is pointed out that the Internet is not the information superhighway nor is the World Wide Web – "frequently spoken about" as it is were. At last, bandwidth/data speed, so rarely referred to in reports of Internet services, gets the mention it deserves. The report says, for instance, "even with ISDN downloading video clips takes a long time: about a minute to download 2 seconds of video".

140 pages of this report are taken up by profiles of 22 organisations. They are an odd choice. It is interesting to compare them with Maney's selection in *Megamedia Shakeout*. It might be expected that Maney would be biased towards US companies – he is an American news gatherer. Ovum might be expected to have a European bias but they should be less biased than Maney since they claim that most of the world's leading companies are their clients.

Many of Maney's "leaders to watch" are not included by Ovum. Notable for their absence are the Belcos Pacific Telesis, Nynex and Bell South; Walt Disney, the News Corporation, Intel, BT (but see later remarks), Sony and many others. Ovum does not include Telecommunications Inc., usually known as TCI, the largest and probably the most highway conscious of the US cable-TV companies. Ovum includes the VA Hospital Baltimore, CERN, Galleria 21 (UK: kiosks), Philips Medical Systems and Hammersmith Hospital, none of which are included by Maney.

The bias expectations seem to be justified. It is certainly very odd indeed for Ovum to include New Prestel with BT mentioned incidentally, particularly because one of the authors of the report worked for BT. Ovum covers Time Warner's Orlando trials in detail but does not cover BTs or the Cambridge Cable/Acorn consortium trials. This seems to be a kind of "reverse bias".

There is so much of interest in this volume that I have only been able to convey the general flavour. The bias criticism does not detract from the wealth of information contained in it. Buy it if you can, if not borrow it, or if you are in London go to the British Library. For some people I have no doubt that the high price could easily be justified.

**Managing Information for Research**, Elizabeth Orna and Graham Stevens, Open University Press, Buckingham and Philadelphia, 1995, ISBN 0 335 19397 8, 191 pp., £8.99 (Hardback £30).

In view of my comments about book prices above I was interested to know more about the large price difference between the softback and hardback copies of this book (which I enjoyed very much). Sue Haddon of the Open University Press tells me that the softback, printed in relatively large quantities, is for students, while a smaller quantity, more robustly bound, is for libraries. Here you have an interesting combination of considerations including production costs, what the market will stand and the type of buyer.

Call back yesterday. Bid time return.  
I wasted time and now doth time waste me.  
William Shakespeare (Richard II)

Armed with quotations from William Shakespeare, Oscar Wilde, and Lewis Carroll you could probably find something to cover all circumstances. The point implied by the second of the above quotations is that the speed of passing time increases with the age of the time traveller. When I was young a week took a year to pass. Nowadays I estimate time's passage by perceiving the frequency of putting out the rubbish bins for weekly collection. It seems to have become a daily chore.

In her chapter about "Managing the Time Available", Orna quotes Lewis Carroll from the dialogue between Alice and the Hatter. Referring to Time personified the Hatter says:

If only you kept on good terms with him he'd  
do almost anything you like with the clock.

Orna's book covers research preparation, managing supporting information, documenting the research, time management, planning and designing presentation products, and arranging layouts and typography.

Orna puts the whole business in a nutshell with:

- How do I get something useful out of a source that I know has something relevant somewhere?
- How do I use my time cost-effectively in taking note and selecting quotations?
- How do I store all this so I know where I have put things?
- When I want to write up a section on a particular subject how do I find everything that's relevant to it in the material I have collected?

Orna keeps stressing the time element: "Collecting information demands a large investment of time and trouble, so it is a pity to give yourself extra trouble by leaving it in a disorganised heap..." It is difficult to define information but Orna does it well: "Information is the visible or audible form into which we transform our knowledge when we need to communicate it to someone else".

Some clear advice is provided about tackling a research project systematically, particularly in respect of surveying the relevant literature. Methods of indexing are well described. Orna continues with three excellent chapters on the design and editing of a research report, applicable to many kinds of writing.

A number of examples show how justification, inter-character and inter-line spacing, line lengths, choice of type size and page arrangement affect the appearance of a document. Unfortunately anyone who writes articles or books for a publisher and supplies the material on disc is at the mercy of the sub-editing department. That function seems to me to be most important – it can improve your material or make it look awful. Unquestionably the "look" of a page depends on a good sub-editor.

The last chapter "Transforming knowledge into written information: designing your writing" should be read by all those people occupying senior positions who were obviously playing truant during English composition classes. My English leaves something to be desired but as a journal editor I get articles containing interesting subject material written in a dreadful English. The writers have never heard of writing design. Here is an interesting piece of advice; "if a clause has a comma at one end and not at the other, either the single comma must go, or it must have a partner added".

Consider, for instance, Orna's example from the *Radio Times*: "The BBC presents a programme about Alfred Hitchcock, who died in August last year with the help of John Russell Taylor and Lindsay Anderson".

One of the commonest difficulties which might have been included is the correct use of “who” and “whom”. When I am uncertain I plump for “who” as being the most likely. A different aspect which Orna does not actually spell out, is the effective use of “white space” – a salient feature in her examples.

Orna says in her preface that “many students are finding that their previous educational experience has not prepared them... for writing about their results”. Without wishing to assume the mantle of “Anxious from Hove” writing a letter to *The Times* complaining about educational deficiencies, I am sure she is right. Her advice is equally applicable to those who should know better, and should surely read this excellent book.

A.E. Cawkell