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Electronic Publication?

A. D. Miall

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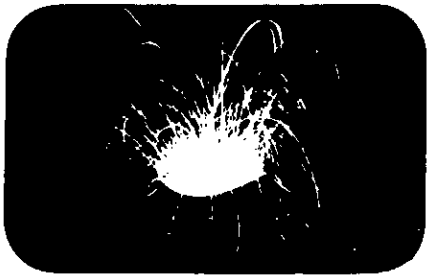

Pyroclasts

Electronic Publication?

A.D. Miall

Futurologists and technocrats would like to plunge us unwittingly into a golden high-tech future in which computers do everything for us but brush our teeth. For example, in such varied journals as *Geotimes*, *University Affairs* and *Homemaker's Magazine* the demise of conventional publishing is predicted. Subscribers to newspapers or journals will, we are told, soon be plugging into data networks and reading from CRT screens rather than hard paper copies. Is this really likely to happen? My own prediction, for what it's worth, is no, not for at least a decade or two. The technological revolution will have to be much further advanced before this change becomes feasible.

Computers, in the form of word processors, are, of course, already widely used in the typing and editing of text for newspapers, magazines and books. Computerized systems are also standard equipment for typesetting. This is the so-called "cold-type" process, which has almost replaced "hot-type" lead typesetting. *Geoscience Canada* is now "computerized" in this fashion. Text submitted by authors, editors and columnists is all entered on disks by the University of Toronto Secretarial Services Unit. Typesetting codes for the printer are then inserted on the same disk records, and the disks are physically delivered to the typesetter, who runs off the galleys without further effort. The codes specify type style and size, line length and spacing, paragraph indentation, etc. All this is automatically handled by the typesetting equipment. Further streamlining could be accomplished by transmitting the disk copy to the typesetter on a telephone data line. In addition, authors can now submit copy to us on disks – provided they use a Micom word processor (standardization of internal codes for word processors is the next, rather mundane necessity for the advancement of the computer revolution).

These procedures have eliminated the need for one text entry and proof-checking stage and have resulted in a significant saving of time – though not cost (word processing services are not cheap). However, this is still a long way from true electronic publication.

Some electronic publications are already in existence. For example, computer buffs and some medical specialists have established private electronic newspapers, to which access is obtained using a microcomputer with a telephone hook-up. This is a very long way from a fully developed electronic publication system. Present computer technology can handle complex visual material. For example, the Canadian Telidon and British CEEFAX systems can produce pretty coloured graphics, but I suspect that the systems are too expensive for routine use on line drawings, which are commonplace in geological publications. Present systems are also very limited in their choice of type style and size, and the "pages" are small (80 characters maximum per line). Therefore, CRT screens cannot yet compete with the graphic and design skills that have evolved over the years with the growth of the magazine, journal and book publishing industries.

Then there is the question of hard copy. Readers are not always prepared to sit at a desk to study their favourite publications. They read them on the bus going to work, in bed, propped up in a boat on their favourite fishing lake, and so on. Perhaps in the future we will have small, lightweight, battery-powered terminals capable of pulling in *Geoscience Canada* off a satellite while we are relaxing somewhere on Loon Lake. Until then, I maintain, electronic publishing cannot hope to compete with conventional (albeit now computer-aided) hard-copy publication. Even then, there is a distinct advantage to having a hard copy in one's hands to facilitate flipping the pages to and fro, checking figures against text, and so on. Equipment is available to make paper copies from a CRT image, but it all adds to the cost.

As most readers will be aware, the Geological Society of America attempted a quantum leap into the future with the change to microfiche publication of the Bulletin. However, the result was such a cumbersome Bulletin, with none of the physical attractiveness of a properly produced journal, that authors abandoned GSA in droves. Microfiche is not an electronic publication, but it suffers the same disadvantages discussed in the previous paragraphs, and it seems unlikely anyone else will repeat the GSA experiment. Microfiche should be used only to save space in the publication of data tables and appendices, and this is the present practice of the Geological Survey of Canada. The GSA has now gone back to conventional publication.

Some have suggested that electronic storage of journal articles will not only speed editorial processing (true, as described above) but will save printing and storage costs. J.D. Martin, writing recently in the Newsletter of the Social Science Federation of Canada, suggested that complete journals would never have to be printed because subscribers need only request that the articles in which they are interested be sent to them electronically. A kind of ethereal reprint service. Only abstracts would be circulated in hard copy form, from which readers would make their selection. This might work for ephemeral printed matter such as news and current events, but it would hinder rather than enhance the kinds of research that build data and hypotheses over years of constructive work. Availability of back issues in hard copy facilitates the most instantaneous kind of data retrieval: "pick it up and read it". One's research interests tend to evolve or even switch entirely over the years, so that a shelf full of journals that have been built up essentially as a set of reprints reflecting current interests may not serve the scientist at all well. Many is the time I have gone back to an old journal article, the significance of which only struck me long after it was published.

Presumably, old articles could always be retrieved from a vast electronic library file. This brings us to another vision of the computer enthusiasts: complete electronic storage and retrieval of entire libraries. Experimental systems of this type are already in existence and, we are told, will vastly increase literacy by putting facts and ideas at everyone's finger tips. The idea seems to be that because kids enjoy playing video games on their friendly home computers, they will enthusiastically tap away at the same keys to learn how to spell "the cat sat on the mat" or the elements of Quantum Mechanics. There is something wrong with the reasoning here. We are forgetting that vast data banks already exist, and have already been partly responsible for the vastly increased literacy in the developed nations. They are called libraries. Public libraries, university libraries, national archives, are all part of this network. Children's public libraries are delightful, friendly places, and seem likely to retain their appeal and usefulness long after the novelty of tapping in little green numbers on a screen has worn off.

Could electronic libraries assist the work of the serious researcher? This was a question I began to tackle in a *Geoscience Canada* article in 1975 (v. 2, p. 193-197), and my views have not changed much in the intervening years. Electronic retrieval

relies on keyword flagging of relevant information, so that the efficiency of the process depends on the skill of those choosing the keywords. Often this is the authors of the articles being entered on the system. Presumably, they should know what they are doing, but sometimes an article or data file may become important for a purpose not envisaged by the author, and may not have been tagged with the appropriate keyword.

Electronic storage systems, including bibliographies, can only be reliable if they are complete. This takes a lot of money. Because of the recent Korean Airlines disaster, we have all learned that the Pentagon stores and processes radio message intercepts on a world-wide basis at a rate of a million words a minute. If libraries had the Pentagon budget they could probably produce an equally efficient electronic library system, but they don't and never will. Surely, for most research work such an enormous system is simply not necessary. As I wrote in 1975, when carrying out library research "is it not equally efficient to go to a textbook or a recent paper in one's own field of interest and check the list of references at the end of it? The references retrieved in this manner are already sorted selectively, for the writers who chose them did so because the articles were known to be useful and relevant." One also keeps up to date by checking current issues of relevant journals, or by attending conferences and consulting colleagues. C.F. Burk, in a discussion of my 1975 article, claimed that this was naive because about 100,000 papers in geoscience are published around the world every year, and cannot possibly be searched for relevant articles without the use of a computer-based bibliographic system. This objection is silly, because it ignores the specialized function of journals. Nobody is going to search for an article on hummocky cross-stratification in *Geochimica et Cosmochimica Acta*. And if I want something on Canadian geology I can exclude from the search all non-Canadian journals except those known to be international in scope.

Where large files, such as bibliographies, exist it is undoubtedly more efficient to store them in electronic form. Such systems as GeoRef have been in existence for several years and their continued existence demonstrates that they must be useful to somebody. One possible use is for gaining a quick entry into a subject area entirely new to the researcher, but beyond this point old-fashioned methods of library research, such as are outlined above, are probably more efficient.

We can rely on the computer enthusiasts to trumpet the advantage of each new technological advance, but it always seems to be left to the innocent user to discover the weaknesses. We should therefore approach each new development with caution. Computers, like airplanes, tooth brushes and waterproof matches, have their place in the scheme of things, but we need to learn where that place is and how to keep them there.

I will believe in the future of electronic publication when I can press the output button and have land on my desk a nice crisp new book, with beautiful design, attractive lettering and the smell of shiny new paper. Five hundred years of adapting printing and publishing to the psychology of reading and study cannot be all wrong.