

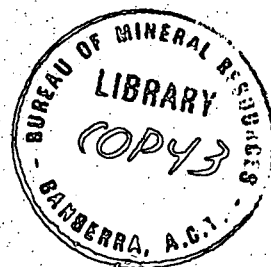
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DEPARTMENT OF
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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

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SCIENTIFIC PUBLICATION

by

K.A. Townley

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INTRODUCTION

Publishers of scientific material are beset by one or more of three main problems:

- (1) paper shortage
- (2) increasing cost
- (3) volume of work published and offered for publication.

The same problems also affect librarians and of course readers, and, to a certain extent, authors; but I am here concerned to view them and to offer tentative solutions from the publisher's point of view. Since I am also Honorary Editor of the Geological Society, and since the Journal of the Society is a favoured vehicle for publication by BMR officers, I shall discuss the possibilities open to both BMR and the Society.

In the course of the discussion I shall refer again and again to micropublishing. This is a technique of producing publications as micro-photographs either on roll film (which will accommodate as many pages as are needed) or on cards ('microfiches'); about 90 pages of a book can be photographed onto one 6" x 4" card, and by a new process known as 'ultrafiche' about 2000 pages can be fitted onto such a card. With either film or fiche a film reader is needed to magnify the image back to normal size, and a printer or reader-printer to reproduce the micro-image at full size. Full-size prints are known as 'hard copy'. Both roll and fiche are in fact microfilm; but for convenience the term microfilm is restricted to roll film.

THE PROBLEMS

1. The world-wide paper shortage that has become apparent over the last year or so is not yet well enough documented to allow of confident forecasting; but it is clear that for some time the demand for paper pulp has outstripped the regenerative capacity of forests. Sweden, Canada, and New Zealand have all recently reported serious depletion of their wood supply; and one of Australia's largest paper wholesalers reports that it is operating some 6 months ahead of its quota.

It would be reasonable to expect that the slack could be taken up by the big users - newsprint and cheap stationery; because the demand for fine papers for book and serial printing is relatively very small. But there are signs that the fine papers will be in short supply quite soon, presumably because they require fresh pulp, not recycled material. If this is so, it will be a major factor in any proposals for the future path of scientific publication.

2. Cost is an increasingly worrying factor, both to the learned Societies, whose income is determined by what they can raise in membership subscriptions, and to Government institutions like ourselves, who are morally bound to make the best of the taxpayer's money that they are spending. A rough breakdown of printing costs for a BMR Bulletin and an issue of the Journal of the Geological Society is shown in Table 1.

Table 1: Printing cost per copy of BMR Bulletin 141 and
J. geol. Soc. Aust. Vol 19, No. 2.

(NB Bulletin costs as at August 1973; Journal costs as at August 1972)

<u>ELEMENT</u>	<u>BULLETIN 141</u>		<u>J. GEOL. SOC. AUST. 19(2)</u>	
	\$	%	\$	%
Paper	1.08	22	0.42	21
Composition	1.14	42(Composing)	0.50	45
Blockmaking	0.94		0.41	
Printing	0.76	15(Printing)	0.32	16
Folding	0.43	21(Binding)	0.17	19
Collating	0.12		0.05	
Sewing	0.19		0.08	
Trimming	0.16		0.06	
Binding	0.16		0.02	
Total	4.98		2.03	

To the costs in Table 1 must be added

- (1) Editing, typing, proofreading, and other redactorial costs
- (2) Drafting
- (3) Distribution.

These are much more difficult to quantify, because they are dispersed labour costs. A very rough estimate could add \$7 to the cost of the Bulletin for redactorial and drafting work, and 50c for distribution. The Journal has such a large honorary content that (1) and (2) cannot be estimated; distribution costs about 30c a copy.

Another way of looking at costs is that for a print-run of 1200 copies of a 232 p. book, each page costs some \$25 to print; and for a print-run of 2700 copies of a 138 p. Journal, each page costs \$39.

Costs over the last 2 or 3 years have been rising at 10-15% per annum. There is no sign of slackening in this rate; indeed, if paper shortage is expressed in higher costs, the rate will rise.

3. 'Volume' covers quite separate factors:

- (a) Storage, which for a publisher with a large list is a growing problem. The Bureau has over 250 Bulletins and Reports in print, and about as many geological maps and notes; and more than 1000 maps without notes.
- (b) Volume of material offered for publishing. This impinges directly on both readers' and authors' interests: the author wants to have his writings printed; the reader is defeated by the mass of printed matter presented to him. But it is also a publishing problem because it directly affects both use of paper and cost.

The other aspect of storage, which is not a publisher's but a reader's problem, is that of the space taken up on library and readers' shelves. The Bureau is of course considerably affected by this: the Library is rapidly running out of space; sets of Records - not, admittedly, publications - occupy several rooms; and some individual officers are beginning to find their space allocation inadequate by reason of the books and serials they must keep ready to hand.

To sum up the impact of the various problems, we may say, rather tentatively, that paper shortage is a potential problem, not immediately menacing, but probably a factor to be reckoned with in the next 10 years or so; cost is becoming a fairly urgent problem for learned societies, and could well become a serious factor overnight to the Bureau if pressed by an economy-minded Treasury; and volume is a universal problem, clearly becoming more urgent daily.

On balance, an alarmist position is certainly not justified, but the problems will intensify with time. The purpose of this paper is to examine them in comparative tranquillity, so that we may be ready with acceptable solutions when the time comes.

POSSIBLE SOLUTIONS

The questions posed by these interlinked problems are two.

Simply: What shall we publish?

How shall we publish?

A simple decision to publish less would contribute towards the solution of all three problems. But it is clearly not sufficient, nor satisfying, because it means the suppression of much material, to the detriment of the reader; and the reader is the whole reason for publishing. Perhaps it needs stressing that publishing is a service: it is a link between author and reader, and if it fails either it is not doing its job.

Moreover, since the Bureau as a publisher has a different function from the learned Journal, the two cannot be considered together. The purposes in writing are different, though they overlap; and the readerships are different, though they too overlap.

BMR Publications

Let us first consider BMR. Its first and perhaps basic publishing function is to produce maps, many of which are highly complex and in many colours. Some but not all of its maps are issued in or alongside text publications such as Bulletins, Reports, and Explanatory Notes. The salient points about a map in terms of publishing strategy are: small editions; variable life; high cost; great complexity; large size; and, sometimes, link with text publications.

Most Reports are written essentially to present the facts of an investigation; though they do usually include interpretation, concepts, and hypotheses, their basic function is information. They do not include coloured maps, but may contain large black-and-white illustrations. They are traditionally printed by offset lithography from typed (Justowriter, etc) masters.

Bulletins contain (hopefully) less data and more interpretation; the evidence on which the interpretations and conclusions are based is rather referred to than set out. They are cloth-bound, generally longer than Reports, and may contain large illustrations, including coloured maps. In some Bulletins and Reports, especially of seismic work, the large illustrations are of irregular shape - strips rather than near-equilaterals.

For the moment, at any rate, I should be inclined not to advocate a change in the printing of coloured maps. Printing is admittedly very expensive; but a much higher proportion of the cost is input cost - that is the operations that must take place whether you print one map or 10,000, such as colour separation, plate-making, make-ready, and dye-proofing - than running cost - that is printing and binding. And assuming that the final product is to be of the same standard little can be done to reduce input cost, and economies in running cost will not have a proportionate effect. Also, it is not yet commercially feasible to miniaturize coloured maps for effective micropublishing nor to return the miniaturized map to full scale. When this becomes feasible the subject can be reconsidered, because micropublishing can cut out many input costs as well as reducing running costs: a single hand-coloured fair-drawn map as copy would cut out colour separation, plate-making, and dye-proofing.

Single-colour maps, and perhaps maps in line colour only, could be considered for micropublishing. The sole difficulty - but it is a big one - is that of returning a microphotograph of a map to its original scale: if it is over a certain size, reader-printers cannot cope with it in one shot. The possibilities should be investigated.

With maps we are dealing with well defined requirements by readers; with texts the requirements are more variable. It is probably fair to say that more than half the issued copies of a Report or Bulletin are destined for archives and very occasional retrieval; most of the remainder are read in summary only; and a very few - probably never more than 10% - are thoroughly read and re-read. It would seem, therefore, at first sight that three varieties of publication are needed.

- (1) micro-edition for archives and reference
- (2) summary only
- (3) full sized copy (= 'hard copy')

In theory, at any rate, this can be done by producing

- (1) a hard copy of the summary
- (2) microfilm or microfiche of the entire volume.

Summaries of several volumes issued within a short interval - say 3 months - could be issued together.

Micro-editions would be sent to all libraries and subscribers who did not specify hard copy; to the rest, hard copy produced from the micro-edition would be sent, either all or in part as specified, at so much per page.

I have elsewhere detailed the various economies, in paper, cost, and volume that can be made by micropublishing. Assuming typed or computer-set copy, the savings are of the order of:

Paper	: 70% (allowing for 'hard-copy' on demand)
Cost	: 75%
Space	: 90%
Time	: up to 95%

This scheme is fairly easily put into practice for Reports. For Bulletins it would entail some loss of quality and considerable loss of 'presentability'; moreover such Bulletins as are accompanied by coloured maps would not readily adapt to it. A variant would be to issue the map separately rather than as a part of the Bulletin.

The scheme is not applicable to explanatory notes, because they are too intimately linked with maps to allow the one to be at full size and the other at microsize; and if we wish to economize on them we can only consider printing the notes on the back of the map. This, I admit, I am loath to suggest because it seems to be a backward step with few other advantages than economy. It should be considered only if the need for economies, either in paper or in cost, becomes paramount.

The Journal of the Geological Society of Australia

Now let us consider the learned journal. Here the problem is somewhat different, and several solutions can be offered. Most of them, however, involve the abandonment of a good deal of cherished and traditional scientific thinking; in particular, the tradition that meticulously marshalled evidence shall accompany arguments and conclusions.

These are some of the possibilities:

1. That only summaries of papers be published in the Journal, but complete copies of any particular paper be available on demand

- (a) either from the Journal or from a central Information Centre;
- (b) either in microform or in hard copy;
- (c) either free to subscribers or on pro-rata payment.

Each of these alternatives needs to be examined against the total economics of the situation, along with the question of the form of (a) the Journal, (b) the complete papers - that is, whether they are handset, computer-set, or typed, and whether they are printed letterpress or offset or not at all.

2. That papers of broad significance be printed in full and all others in summary, with access on demand as before. This possibility, which is put forward by the editors of J. geophys. Res (J. Geosci. Inf. Soc., 2, 1972), carries with it a public avowal of what is and what is not important. Authors would dislike it, and editors would shrink from it.

3. That summaries of papers be accompanied in the Journal by review papers written by selected scientists with access to all summarized papers on a particular field.

4. That the Journal be micropublished in its entirety, separates being available on microfilm and the Journal on either microfilm or microfiche.

Table 1 shows that input costs for the Journal are about 46%. If the Journal were micropublished they would, at present standard, be less (25%), because blockmaking would not be necessary - the copy could be used direct for microphotographing. Printing would involve microphotographing corrected proof in form, and would cost only tens of dollars per issue plus, say, 30c per copy. The saving in cost has not yet

been thoroughly worked out, though costs are being investigated experimentally in the Bureau. The saving in space would be enormous; and there is a special economy in that there are no 'remainders' and no out-of-print volumes, for the exact number of copies needed can be made, and extra copies made singly on demand in a few minutes.

I am very aware that in putting forward tentative solutions to the problems I have neither exhausted the possibilities nor solved the problems inherent in the generalized 'solutions'. A good deal of hard-headed and unbiased accounting needs to be done before 'solutions' can be evaluated economically, much less from the point of view of author and reader.