Geoscience Canada

Letters / Lettres

Volume 4, numéro 4, november 1977

URI : https://id.erudit.org/iderudit/geocan4_4let01

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Éditeur(s)

The Geological Association of Canada

ISSN

0315-0941 (imprimé)
1911-4850 (numérique)

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Citer ce document

(1977). Letters / Lettres. *Geoscience Canada*, *4*(4), 214–218.

Letters

The Great Flood— That Is Not ?

J. D. Aitken's witty words on the Richter-scale for geological publications are likely to become a standard expression among Canadian earth scientists. It also seems that he has thrown a stone (perhaps a rock sample?) into the hornets' nest by his article "Publish and perish" (*Geosci. Can.* v. 4, no. 2, p. 100-101). One of the dangers of making so many points that there are plenty of them to disagree with.

Who would doubt that the scientific communication system of meetings and publications is in bad shape? It is like Churchill's characterization of democracy: the worst existing system except all the others. There is, of course, ample room in the communication system for reforms: to upgrade standards, emphasize originality and excellence. However . . .

I am sad to learn that there is an "alarming inflation of geological literature". But I am glad that a solution is offered: heal the dog's bite by the dog's hair. That is, a new periodical should be launched to carry a great load of "brief progress reports, not exceeding two pages".

Such a forum where "evidence of work in progress" is given in short form already does exist. It convenes annually as the GAC/MAC Annual Meeting and its results are documented in anti-inflationary (should we say "deflationary" or "deflated"?) form as "Program with Abstracts". This practice has evolved as naturally as any ecosystem and serves the Canadian earth science community well. Ironically, the way Aitken would reform the communication system is to abolish the very forum which already fulfils his aims - a common disease of reformers and revolutionaries.

It is an exaggeration to say that the only saving grace of meetings is the immediate discussion of the presented papers. It is an important feature; but a meeting first of all is, in the literal sense of the word, a meeting, an opportunity to meet. Canada is areally nearly as big as Europe with all of her 33 sovereign countries (and one crown colony, to be exact). A thinly distributed diaspora of earth scientists live in the far corners of this vast land. They welcome the annual opportunity to meet other members of the geo-diaspora and feel by the Hungarian poet's words (Vörösmarty: Thoughts in the library):

"I am not alone! I have siblings . . ."

This annual pilgrimage is also a great occasion to obtain from the lectures a cross-section where our science stands now - not where it used to stand last year as reflected in the journals or five years ago as one may read in the textbooks. Ideas are also exchanged among colleagues about the papers or about other relevant topics.

Let us accept (just for argument's sake) the opinion that the "expense of . . meetings . . . can scarcely be justified, other than by . . . that an oral presentation permits immediate discussion". It is still difficult to see why this great opportunity would be restricted to four generals of science per day. Surely, 20 humble G.I.s - like me - can also profit from the discussion of their papers! Perhaps a better economy of time is possible. The successful 1975 International Water Resources Association congress (New Delhi) comes to my mind. The lectures were preprinted and distributed. The conveners of each session of five or six papers briefly drew attention to the new or controversial points. After that, the entire time allotted to the individual authors was used solely for discussion. It was a lively congress.

I entirely agree with Aitken's point that excellence should be honored by more time both for presentation and discussions. Perhaps the following system would work. A longer abstract (say, two pages including diagrams) would be preprinted and distributed. Each day at each session only one paper would be orally presented and for this paper a lengthy (one hour?) discussion period is secured. A convener would point out briefly the main features of the papers. All the authors' time would then be divided between slide presentation (not longer than half of the allotted time span) and discussions.

It is a surprise to me that in the Canadian earth sciences "reform from the bottom up cannot work, reform *must* commence at the top, that is, at the level of the administrations . . ". But what would you expect in a society where there is a "competitive scramble started by a few cynics and egomaniacs and now self-reinforcing". Hence the need to eliminate competition from the bottom and rule by the iron rod. Perhaps capital punishment would also be doled out from the capital. During my young professional years in Hungary scientific life was regimented "at the level of the administrations" and competition was successfully abolished. Some of the "masters" were good geologists, I could even name an excellent one. Still, this regimentation had to be one of the causes of the mass exodus of the Hungarian geologists. Out of the 30-odd persons who received M.Sc. in geology at the same time as I in Budapest, there are now four of them living in Calgary alone. They should be asked about their experiences with regimented scientific life and "a Council of the masters"; I can supply their addresses.

Moreover, I agree with the English writer who had advised not to trust the

method which can save only the human race but not the individual. Not any "Council of the masters" but just the individual geologists (slaves, if we accept the "master"-terminology?) can work better, be more humble, shed cynicism and egomania (as far as human beings are able).

There is no better way to achieve healthy humility than looking upwards to the gygases who piled the Ossa on the top of the Olympos (to mix up stratigraphy, no doubt). Yes, we need geniuses like Darwin used to be. How many? Well . . . there is an old Hungarian joke:

> A rich, upstart city invited some famous musicians to perform. The head of the Chamber of Commerce asked the conductor: "What was the last number?" "A symphony by Beethoven." "Art is a great thing, to be sure. This is a fine city: we have successful businessmen, even millionaires. But I don't guess there are more than ten of our citizens who would be able to write such a good symphony as your Beethoven."

So I would say, we might be satisfied with 10 Darwins at a meeting but let us not to deprive the remaining lesser Richter-magnitude colleagues - these "sawyers of the boards" (instead of being members of Boards!), including myself - from 10 minutes lecture time or some pages of journal space each.

C. R. Barnes and A. F. Nadrett ("The Great Flood", same number of *Geosci. Can.*, p. 114-115) have already pointed out some of the extremities of the article "Publish and Perish" and also emphasized its merits. One can just applaud such proposals as tighter editing and review or the publication of a progress-report periodical. There is one point, however, where I have to disagree with all the three authors. I am not conviced about the existence of any Great Flood of earth science publications generally and in Canada especially. Quite the contrary.

The Canadian earth science literature must cover a huge segment of our planet and a number of specific problems which are not important in other countries. Glaciology, oceanography, Precambrian stratigraphy, kimberlite-problems and perhaps even remote sensing are only exotic readings in Hungary while these topics are of practical significance in Canada. Hungary has a landmass equivalent to one per cent of that of Canada and no seas at all. Though I have not counted pages, titles or periodical issues, I estimate the volume of the annual output of the earth science literature of the two countries to be in the same order of magnitude. The same is true for some other small European countries like the Netherlands or Switzerland. As for quality, it is more difficult to compare. I would especially hesitate to place exactly such top-of-the-Richter scale personalities as Eötvös used to be in geophysics or J. T. Wilson is in geognosy. I can hazard, however, that the quality and the total contribution of Canada, Hungary and the Netherlands during the last two decades are about equal in hydrogeology (my specialization) and all these three countries are among the top half of a dozen ones.

I just completed, by coincidence, a brief evaluation of the earth science literature (especially in hydrogeology) in the developing countries, for the Assoc. of Geoscientists for International Development. Apart from a few countries, looking only at the sheer quantity and availability of the published text, the output is painfully inadequate.

What do these international comparisons prove? First of all that Canadian earth science output is quantitatively about in the middle of the worldwide scale. If the worldwide scale is inflated, of course, then this output is too much; if not, not. Being that one side of the scale is marked as inadequate, the whole does not seem to be inflated; moreover, an area of inadequate coverage by the Canadian geological literature is pointed out later on.

What about quality? Internationally, the contributions of Canadian earth scientists are measured by exceptional ones (say, Richter 5 and up) and there is hardly any reason to be ashamed. Internally, however, the quality of the average and even below average mass is also important. What is the quality of this mass and mess of papers? Perhaps not as bad as the holy wrath of the reformer points out. But even if the standard were much, much higher, still we should and would try to improve our performance. This is why the efforts of Aitken must be welcomed even if some of his attitudes and proposals might be rejected.

As for the Great Flood - there is none. There is no drought either but a little more rain would do good. Definitely, let us launch Aitken's periodical for progress reports: it would give more publication space, keep us up-to-date and help establish priority. The latter is also important for us dyed-in-the-wool egomaniacs. I, for instance, had a small priority claim of first using a space image to solve a hydrogeological problem, back in the stone age of the pre-scanner technology. My report was of restricted distribution and only after six years was I able to formalize my claim in a congress contribution. Small fry in the Great (?) Flood but an important one to poor cynic me. Alas, the times are passed when a host was fed by some small fish - nowadays thousands are needed from the provender in between the whales (which are anyway an endangered species).

The Canadian earth sciences are still expanding both in scope and space, an envy of the European geologists. Canadian speleology is just a decade old, the hydrogeological investigations of northern Alberta perhaps half of that age. There is one field, however, where Europe (because of reasons of history and size) is in better position. We would need more, far more of the detailed local studies which bring the intimate knowledge of the country which is a treasure to every nation. I wish we would have more of such papers forthcoming (among others), at the level of quality and sophistication that Aitken envisages. A Great Flood? No, the fertilizing flood of the Nile as it used to be - until a dictator of goodwill dammed the river at Aswân, converting the fertilizing deposits into rotting mud.

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Comment

"Publish and perish"? - I have been involved in that activity and am an avid consumer of geologic literature so I am stimulated to respond to Aitken's anguished review of geologic communication. My interest is in fields that generate large amounts of data and are only weakly controlled by elegant and simple theories. The synthesis of diverse, and sometimes conflicting, bits of information is required. Agreed, that the literature explosion is shocking and the quality variable but has overall quality degenerated? I don't think so - we are just being overwhelmed by our own growth as a profession. It's another population explosion whose impact is not eliminated by improvement in the behaviour of individuals - and we are stuck with this growth in any resource- and environment-dependent society.

Has the world changed greatly? No way! The trivial publication, rambling discourse, and moans of the burdened reader go back for centuries. To quote an ancient scholar:

> "One of the diseases of this age is the multiplicity of books: they doth so overcharge the world that it is not able to digest the abundance of idle matter that is every day hatched and brought forth into the world." (Barnaby Rich, 1613)

Our frustration is not new!

Several years ago I tried to follow the development of geochronometry during its first decade or so. It was instructive to encounter the many short research-in-progress, new-interesting-unexplained-observation, new-element, new-isotope, new particle, etc. papers that came almost monthly from the famous scientists involved. Many of these papers were not terribly important. Some were even wrong. But this chatter persisted in the literature - little increments leading to major breakthroughs. Our perspective today is just to recall the few great papers that emerged - those that are reread, quoted and given on reading lists. But there were many, many more. Survival by citation, quotation, and assignment to students is a reasonably efficient filter and selective process. The publication style of scientists hasn't changed much - but like fossils only more robust and memorable publications survive to provide our image of the past.

I think publication is a necessary and vital part of science. It is a reasonably efficient and very democratic form of communication. Moreover, when one does research funded by another agency, corporation, or individual there is an obligation to report the results, even if they are modest or of limited interest. The essential quality of the publication process is selectivity. The good meaty papers should end up together in prestige journals but the others need appropriate resting places - even if on microfilm with published resumes so that access is possible, even if moderately inconvenient. Abstracting services (currently a rather confused and unsatisfying system for readers of English) and review papers are not luxuries but necessities. The "boards and bricks" have to be findable, and individuals have to be rewarded for gathering them into organized structures. Trying to stop the flood is both unlikely and counterproductive. I think review and editing processes today are as effective as ever, and probably better, in guiding papers to their appropriate fate and in improving papers as they progress from manuscript to published form. It is too bad the anonymous reviewer derives so little for his effort as his effect on the literature explosion - its volume and content - can be large. There are few tangible benefits for doing this job well, and that is perhaps unfortunate.

Proliferation of literature and degeneration of quality do not necessarily go hand in hand. For example, the improvement in scope and quality of Ph.D. theses in geology over the past century is a clear and easily documented phenomenon. Anyone who has read many old theses can testify to this change and its testimony of improving standards and rising norms of scientific accomplishment.

People, like papers, tend to be sorted by quality. At all of the more respected universities the review of an individual's publications is not of quantity but of quality. The papers must not only exist, they must be read, and remembered, to establish the "scientific reputation" that promotion committees seek to gauge. Although publications cannot be the only valid criterion for promotion they are a proper test of participation in science. Any publicly supported scientist who hoards observations and ideas is of questionable value as a scientist - without communication he adds nothing to the global scientific heritage. Financial support for his research cannot be justified as it is pure self-indulgence and removes resources from others, perhaps more deserving.

Meetings are a special problem, and one that has developed even more rapidly than the literature explosion. One way to deal with the growing excess of meetings is to ignore them. Many past assemblies are deservedly forgotten; most have little long-term impact except as social meeting grounds. I much prefer field trips and don't go to a general meeting just to hear the papers. Topical meetings without concurrent sessions are the ones I find best scientifically. Anyway, in the long run the published record is what carries science forward. An important work presented at a general meeting will reach only a limited number of receptive individuals. The organization and presentation of the paper is a possible way to sharpen one's thoughts and to obtain critical feedback before publication but is no substitute for a penetrating manuscript review.

As the cost of energy for travel becomes greater I expect this problem will become spontaneously rectified . . . And the fewer meetings will each be more special and exciting. If people stay at home and work perhaps there may even be an improvement in the quality of the papers written. Those concerned about the future can conserve both fossil fuels and living trees by staying at home and writing more concise and thoughtful papers. As a bonus they can go for a walk in the woods and live longer, more relaxed lives!

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We all echo Aitken's criticisms of scientific meetings, including those of the GAC, but in my view our national association is neglecting an excellent means of communication that could ease the load on conventional presentations: poster sessions. My acknowledgement for a poster abstract for the Vancouver meeting was on a form designed for oral presentations; instructions for the poster display arrived the day before I left for Vancouver. The poster room was in a back corner, without directions from the nearby lobby. Finally, no specific hours for authors' attendance were published in the abstract programme. I don't want to blame the Vancouver Committee, but I suggest the GAC Council should formulate a policy to encourage poster presentations. Two or three hours of authors' attendance should suffice; these times should be published with the abstracts. Discussants would then be reasonably certain of finding authors present at the stated times. The room should be in a prominent location, or well marked.

To improve the quality and perhaps decrease the number of oral sessions I suggest a feedback mechanism: one of the session chairmen sits at the back of the room to make notes on each presentation - length, content, slides, etc. Comments, both positive and negative, could be processed automatically and sent to the authors. In due course persistent offenders would come to light, and their abstracts could be refused. If this seems a bit undemocratic, comment cards could be provided for the general audience.

Again, I echo the need for reducing the number of papers published, by more rigourous refereeing. The imbrication technique particularly bothers me: papers that overlap preceding publications by large and quite unnecessary amounts. Presumably the referees were unaware of the repetition; perhaps the author should be required to provide a list of recent publications, so that the conscientious reviewer could check for undue overlap. However, editors should guard against automatic rejection on one adverse review. Unfortunately, rejection through ignorance, or because the referee wished to see the communication suppressed is not as rare as one would hope. In our efforts to combat the publication explosion, we should beware against stifling genuinely useful contributions.

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This letter is in response to the comments expressed by J. D. Aitken in the June, 1977 issue. Mr. Aitken raises very valid criticisms of the existing situation re: the publish-perish syndrome. He touches on the very nuts of the problem when he asks for a definition of Research. What the hell is research? and more importantly can "it" only be done in a university by an academic who couldn't find his rear with both hands in the real world?

Four years of my working life were spent at a respected (?) government sponsored research institute . . . during that time my belief in the foundations of science was destroyed.

Quite frankly I don't believe a damn thing that is written about our science of Geology any more. The motivation of the author is far too often to stretch his ego and he'll lie and cheat to do it.

For god's sake, tell it like it is . . . I'll admit to being a 95 per cent cynic. How about the rest of you pseudointellectuals?

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Black Holes in Saskatchewan?

I have thought at great depth about the origin of the black hole on the front of the June edition of *Geoscience Canada*. Unfortunately this structure is not unique to the Holocene of Saskatchewan as I have discovered two examples in the Enrage Formation (Carboniferous) of Dorchester Cape, New Brunswick (see Fig. 1 and 2). Two important facts emerge: 1) These structures can be formed in gravels as well as muds; 2) They are not bottomless pits and do not contain volcanic bombs, meteorites or any other projectile. The Carboniferous age for these structures probably precludes a human or mammalian origin, although the stratigraphic range of the Sasquatch is not well defined.

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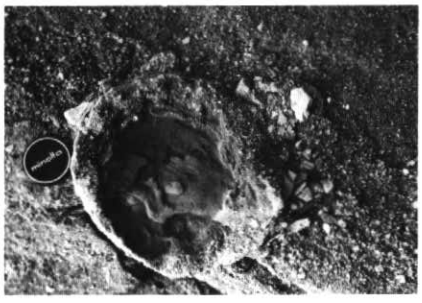

Figure 1
Top view

Figure 2
Side view

The cover of Geoscience Canada, June 1977, shows an outstanding example of what is known in Ottawa valley and points east as a "moulin à la chandelle". This is produced when a spherical object is projected at considerable speed on a low, nearly horizontal arc, is in flight struck heavily, but eccentrically, by a resistant linear body, is deflected upward at an obtuse angle (only slightly greater than right angle) and subsequently by force of gravity drawn to earth at high speed on a near-vertical trajectory. When the spherical object impacts on solid ground it is classified as a "chandelle sans moulin", or, in more common English terms, as a "pop-foul". When it impacts, as in the aforementioned illustration, in soft earth, it produces the typical "moulin à la chandelle", otherwise known as a "plop-foul"!

Professor Hendry may find that the bottom of the crater is occupied by a slightly eccentric sphere, about 10 cm diameter, covered by dumbell-shaped strips of horse hide stitched with cotton and/or nylon twine. He should examine an adjacent pasture for foot-worn tracks in the conventional plan-view pattern for a diamond. Judging from the distribution of ejecta around the crater, one should expect one point of the diamond to be adjacent to the west side of the clay pit (assuming north is top of photo). Hendry may also encounter a group of young athletes wondering where their softball went.

On the other hand, the explanantion may be much more simple. Professor, one of your students is a rock-lobber! (If he used a mud-ball would he know as a land-lobber?). In either case the practice is decidedly unprofessional and to be discouraged. In fact the practice is to be shunned on the same footing (you should pardon the intentional pun) as should be the actions of one who is reported as having "stumbled into the structure".

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Preservation of Cobalt

An open letter to
Mr. R. D. Lord, President CIMM,
Mr. P. J. Savage, President CGC,
and Mr. M. A. Upham, President MAC.

The mineral industries have been so vital to the development of Ontario that the lack of a publicly preserved historic mining centre in this province seems unfortunate. For some years, members of the Department of Geology at this university have considered that the obvious choice for such preservation is the town of Cobalt.

Cobalt exemplifies, as no other Ontario mining camp does, the romance and glamour of the early bonanza days. Cobalt surely ranks beside Dawson City, in the Yukon, and Barkerville, in the Cariboo, both of which are preserved and maintained as historic mining centres in western Canada. It is no accident that the Provincial School of Mines was established close to Cobalt. Nor is it surprising that Cobalt is a mecca for visiting geologists and mining men; our own department operates an undergraduate field school in the region.

Recommendations such as the one made here are traditionally frustrated by shortages of money. Now, however, the disastrous fire that recently occurred in the town will require substantial public funding for reconstruction. Here will be the opportunity to carry the process further, to the renovation of the historically important parts of Cobalt that happily were not destroyed: the headframes, the sheds, the pits and shafts, the dumps, the rail station, and the miners' houses.

We urge you to encourage appropriate colleagues to persuade federal and provincial authorities to take advantage of this opportunity to derive from a disastrous event a real and lasting benefit for the people of Cobalt, the Province of Ontario, and the mining industry of Canada.

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