

# Current Research by Computer?

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# Letters

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## Books for Schools

In the GC August 1975 issue, John Rau who is Chairman of the Education Committee of GAC, has written a penetrating review of geological education in the secondary schools in Canada. He points out that the large numbers of students will get the *maximum benefit if the teacher can provide a stimulating course, not as a rigid and orderly approach but as a science oriented investigation.* However, many of the teachers have a limited background in the subject and although their enthusiasm and motivation is commendable, their capabilities are hampering the presentation. What is the solution? The professionals in every area should be taking the initiative to contact the teachers who will welcome any assistance. Some teachers need assistance but do not know how to get it! One day I was talking to a teacher in another city. He said "What is bostonite?" I said "I don't know - why don't you call up ---" (a professor at a university in his city). The teacher had not thought of that. But I know if he does, a contact will be made and many more questions will be answered. As Jon Rau writes "These teachers may not ask for our help but they need it". The professional who takes the initiative to contact a teacher could make a substantial contribution.

Jon Rau made a significant contribution - a list of activities which any professional can initiate, with benefits which could have a profound effect. The list contains 44 different actions - and if every professional were to act upon just one, the teachers of earth science/geology in Canada would know they have the support to present a more effective course. Will the

professionals respond? Well I decided to act upon just one - #12 - make a collection of books. I asked the faculty in the Department at Western. The response was eighty books - yes 80 - many elementary texts in physical and historical geology. But in addition, books on crystallography, ore suites, paleontology, air photos, petroleum geology, history of the geological science, etc.! A book plate is pasted on the inside of the front cover including an invitation for students to telephone with their questions. The books were divided into three lots and distributed to schools where the subject is part of the curriculum. We anticipate satisfaction for everyone - the faculty, the teachers and the students - by just donating a few books which were only gathering dust.

So I say to John Rau, thank you for taking this initiative - and let us hope that all members of the profession will respond in some large or small way.

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## Current Research by Computer?

For many years Geological Survey of Canada staff have compiled a useful listing of research projects under way across the country (Current Research in the Geological Sciences), relying on the voluntary cooperation of individual research leaders who provided details on a simply-designed form.

This year the form has been redesigned and our spirit of cooperation has plummeted to zero. Why?

The new form is now too long for any typewriter. Since we must therefore resort to hand-writing we are required to put every letter in one of a series of boxes, strung out in groups of 80, that magic number of the new technology; altogether there is space for 1120 alphanumeric characters per form, most of which would be needed to adequately characterise any one research project. Since a director plus two or three graduate students might well be involved in six projects, something like 5000-7000 hand-written characters would be needed, taking perhaps a full day of someone's time. So much for the labour-intensive aspects.

The shortcomings of the coding required confirm our worst suspicions of creeping bureaucracy. Our principal complaint concerns the discipline names which may be used to describe a research project; we find no descriptor for *non-engineering soil science, heat-flow geophysics, speleology, lunar geology, meteoritics, impact phenomena*; we find that a geochemist must describe his work as either *exploration or theoretical*; we find that although *geotechnique* has five subdivisions permitted, none are given to *marine science* or to *geomorphology*. But also there is insufficient space for adequate reference to publications, the geographic area coding includes all

extra-Canadian areas under *other* and the descriptors prescribed for funding designation will reap a rich harvest of confusion from mistakes. Finally, the form appears designed for use in English only.

Instead of using such forms, evidently designed so as to be convenient only to key-punch operators, we are submitting the information requested on the old forms which were infinitely more convenient to the researcher.

As constructive suggestions, we also propose (1) that two typewriter-sized forms be devised, one containing the essential coded information, and one to allow for "free" typing of the abstract and references. Even better, (2) why not dispense with the computer bureaucracy and devise one form that can be typed and then directly photo-offset, much like the G.S.A. abstract form. We admit that these could not be cross-referenced so elegantly, but who *relies on* (not just "would prefer") this cross-referencing? The photo-offset volume could be subdivided into major topics (Geophysics, Geochemistry, Sedimentology, etc.), and it would be up to the *user* to scan the volume and extract the information.

Finally, can we (the users, and pawns in the computer game) afford this computerised volume? With 30 universities, averaging 15 faculty each, with four projects per faculty member (including his graduate students), and 14 punched cards per project (new form), we are looking at punching over 25,000 cards *before* any government projects are included. The only benefit we can see is that cutting down the trees to make paper for the punch cards will create more outcrop on the shield.

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### ... give it a chance

As Layout Editor for Geoscience Canada, the above letter from Professors Shaw, McNutt, and Walker came to my attention at press time and I was invited to respond. I am sure that many geoscientists share their views, so some background information is perhaps worthwhile.

Few individuals will likely dispute the need for periodic objective inventories of research activity in the geosciences. These are essential as reference sources within the science and also for use by those who wish to argue for a larger slice of the scientific pie for earth sciences (see Neale and Wynne-Edwards, *Geoscience Canada*, February, 1976). The Canadian Geoscience Council has been attempting to document current research activity. First, Neale *et al.* (GSC Paper 75-6) provided a status report based on almost 70 discipline-subdiscipline reviews. Second, the 1975 CGC Report (Barnes *et al.*, GSC Paper 76-6) reviews other aspects of current research emphasizing research related to one sector - Canadian petroleum exploration geology. Third, an attempt to provide a more objective status report similar to the Neale *et al.* (1975) volume is currently in progress.

The Canadian Geoscience Council recently assumed sponsorship of the Current Research in the Geological Sciences publication. The CGC Editorial Committee (C. R. Barnes, Chairman, G. D. Garland, Vice-Chairman, T. E. Bolton, G. W. Mannard, N. Morgenstern, E. R. Parker, G. Perrault) attempted to use the Current Research volume as part of a critical analysis of the level and organization of geoscientific research in Canada. It was found to be unsuitable because few projects were reported from the industry sector. In an attempt to make the volume more complete, to allow cross-referencing, to produce lists of current theses, to provide up-to-date print-outs of current research to those involved in producing subdiscipline reviews or with other needs, etc., it was decided to revise the form and employ computer-processable methods.

To answer the specific comments raised in the above letter:

a) there were unfortunate delays in designing and printing the actual form prior to its mailing. These will be corrected for next year. The intent was for an 11 x 14 in. form (for ready copying) with the boxes spaced at regular typewriter-letter intervals.

b) having completed my own set of forms manually I can assure the writers that it does not take a day to complete, but rather a couple of hours (depending on the number and detail of the reports).

c) In any such first attempt, some future modification of the coding may be necessary. The writers criticize the list of discipline categories. Attempts were made to reduce and standardize the list rather than to perpetuate the eternal subdivision of earth sciences; no classification will adequately package a continuum of activities. One important point was to provide a similar list to that used in the next (and hopefully future) CGC status reports. Thus, long-term trends can be identified and some information can be quantified with assurance. The list of categories was approved by the Committee and then by CGC Council (with two representatives from each of the twelve geoscience societies); thus input from many specialists was provided.

d) adequate space is available for the most important reference on each project published during the past year.

e) the great majority of research reported in Current Research is from within Canada; to code all extra-Canadian areas would be cumbersome and is not warranted by the relatively few projects concerned.

f) estimating the funding should be relatively simple, but less so for those in industry and perhaps certain sectors of government; the experiment seemed worth attempting.

g) the ever-efficient Tom Bolton knew that the writers preferred the English form; a French version was mailed to francophone geoscientists.

h) most of the constructive alternative suggestions were considered earlier by the Committee. We simply feel that the present system offers more advantages. Annual updating of previously reported projects will be easier and the entire volume can be printed (photo-reduced) directly from the final computer print-out (cf. new GAC membership booklet).