

were different than the surface water systems. Also the water obtained at depths greater than 410 m appeared to be older than those discharging at the 330 m levels.

The afternoon session started with a presentation by C. Davison (National Hydrology Research Institute, Ottawa). Davison presented the results of studies, completed as part of the high level nuclear waste disposal program in which different borehole methods of characterizing small scale groundwater movement and solute transport through fractured granitic rocks were evaluated. This paper is further evidence of the expanding data base available to researchers trying to understand problems of fluid flow in fractured rocks.

J. Long and P. Witherspoon (paper presented by Witherspoon) discussed the results of a numerical model study in which the authors attempted to develop an equivalent porous media from a network of discontinuous fractures. D. Trimmer (Lawrence Livermore Laboratory) developed the theoretical basis for the transient pressure pulse technique. Part of his presentation dealt with the criteria for optimizing the experimental configuration in order to minimize measurement and interpretational difficulties.

G. Thompson (University of Arizona) gave a very thorough review of the types and characteristics of nonradioactive tracers for solute transport studies. This paper and related publications by Thompson are required reading for anyone planning to conduct tracer studies in fractured and fractured porous rocks. In the final paper, J. Gale and E. Reardon presented the results of a laboratory study showing the development of flow tubes in a grouted fracture. The authors showed the importance of groundwater chemistry in changing fracture permeability and the different interpretations on the transport characteristics of a single fracture that could be made using the basic flowrate and hydraulic gradient data.

The narrow scope of the workshop and the limited number of participants ensured an in-depth discussion in which everyone had an opportunity to participate. The presence of such a large number of active and well known researchers at the general sessions enriched both the presentations and the discussions. The twin goals of providing a forum for researchers to meet and discuss their work on flow and transport in fractured rocks and communicate their progress to the general hydrogeologic

community, were both successfully accomplished by the back to back workshop and the conference sessions.

MS received October 19, 1981

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**Geological Association of Canada  
Association Géologique du Canada**

## **Cretaceous Rocks and Their Foraminifera in the Manitoba Escarpment**

by D.H. McNeil and W.G.E. Caldwell  
Geological Association of Canada  
Special Paper 21, 1981

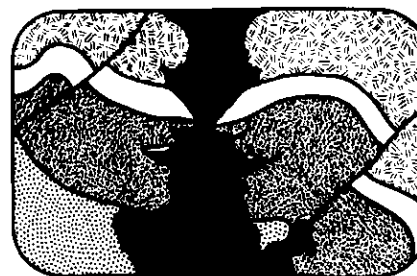
**A detailed account of the stratigraphy of the Cretaceous System (mainly Albian-Campanian) along the eastern erosional edge of the Western Interior basin in the southern Canadian Plains. Critical to reconstruction of the entire basin, the escarpment sequences offer the closest Canadian counterpart to the standard sequences in eastern Colorado and western Kansas. Rich foraminiferal faunas (over 200 species) contain 90 elements not hitherto described from Canada. The volume is liberally illustrated with more than 50 text-figures and 25 plates; 17 plates are devoted to high-quality SEM photographs of the described Foraminifera.**

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## **Roles, Images And Geoscientific Debate**

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### **Editorial Roles**

During several of the technical sessions of the Association of Earth Science Editors conference held in Denver, October 4-7, 1981, the editorial role was identified as the means by which the information exchange process could be brought into focus with present reality, by which target audiences could be tuned into that reality, and by which the public at large could be drawn into participating more fully in the constant change characteristic of this electronic decade.

### **The Technological Time Warp**

In a keynote address, Jim Davis (State Geologist of California) stated that changing scientific concepts require technological communicators to interface with the general public. Just as paleontology was the geological insight of the 19th century, so, in this century, geodynamics and comparative plate-tectonics are changing our philosophical and scientific understanding of the environment. Because earth science information affects our quality of life in very direct ways, an informed public must evaluate the information provided to it in order to come up with appropriate policy decisions.

According to Jack McGuire (Montana College of Mineral Science and Technology) innovative earth science professionals are in the right place at the right time. He spoke of splendid growth opportunities for editors capable of building communication bridges between the users and creators of technology. A slide show presentation of Petroleum Information Corporation (P.I.) served to demonstrate this agency's

powerful role in reporting on the frenetic activity of the U.S. oil patch. Maintaining information records on 1.4 million wells and making that information computer-accessible is only one of the areas of communications covered. P.I. produces publications on "hot plays" which are prepared with the interested investor in mind. Keeping a handle on the operations of 71,000 rigs in the U.S. and Canada requires a high-tech approach to data systems management.

Timeliness is a top priority in the high-speed technical environment. The energy investor wants the latest accurate reports on well potentials and probable production rates before investing his capital. As Jim Davis pointed out, rapid information exchange response time is critical to decision-making and the ability of societies to cope with scientific and environmental changes. The citizens of California need to see damage forecast maps and emergency response plans both before and immediately after disaster strikes.

#### **The Freelance Tightrope**

Obviously, a great deal of agility will be required of the word magicians of tomorrow, given the fact that technology is altering at such a rapid pace. Can the individual technical editor survive in the data quagmire? Fred Raab, maverick technical writer (of W.H. Freeman and Public Arts Network) and P.E. extraordinaire (yes, that is *Private Eye*) gave the authoritative word on how to survive as a freelance agent. Freelancers should keep a keen eye on their cash flow and contract commitments, they should advertise and join freelance networks to expand their contacts and they should also be aware of their unique tax position. Careful management of an independent's business is paramount. It was with a mixture of resentment and admiration that Raab described the single-minded determination of the stick-up man: "armed robbers have such an assertive way of getting paid".

#### **The Psychology of Imaging**

RDD Consultants is a Denver-based advertising firm which specializes in technical writing and multimedia work. Writers Bobby Haldermann and Diane Johnson described the communications process from a marketing point of view.

Questions editors need to ask when confronting the writer-reader "contact" are related to the psychology and expectations of the reader. An editor may ask: "Can I, as editor, determine what will excite the readers and why? Do I want a particular response from them?" Surveys may be one way to get the answers,

determine the direction of technical writing and clarify communication goals. Ultimately, Science must reach the greater community in order to stay alive. Advertising techniques may be viewed as a means of tapping the audience. The approach is manipulative: the idea is to direct the reader. Visual and rhetorical devices serve this end. One technique is experiential familiarity whereby the reader is guided carefully from the familiar to the unfamiliar. Active verbs are more effective in involving the reader on a psychological level. The passive voice is *unfamiliar* and, hence, is to be avoided.

Magazines, graphically speaking, are tightening up in the 80s. A number of devices are used to draw the reader's eye from the cover to the title page of a publication and beyond. "Teasers" run across cover corners, different type styles and colour combinations are tried, photos are bled (no margins), and ragged edges and illustrations can become part of an overall visual design that enhances the characteristics of a story. The art-edit overlap is an important tie-in for the reader and one not to be forgotten in the whizz bang of the word processor.

#### **Visibility and Depth of Field**

Corporate visibility, as well as subject depth of field, are two areas of concern to editors and publishers. The readership and the subject must be carefully interrelated.

Rex Buchanan (Kansas Geological Survey) identified several audiences that the Survey must reach in its publications programme: the decision-makers (the Kansas Legislature) who have non-technical backgrounds and are relatively unconcerned about geology; the State and local governments, some of whom are very technically informed; the business community, which is relatively non-technically informed; the media, which varies with reporter backgrounds; rockhounds (a category unto itself); and the general public, which is quite variable in interest and in knowledge of the subject. The Kansas Survey image is brought into focus by observing the following rule of thumb: any time you try to reach more than one of these groups in a single publication, you are asking for trouble.

Editors Ron Hart (AAPG) and Rex Gibbons (Newfoundland Department of Mines) discussed some very concrete techniques for channelling information flow. Hart emphasized the importance of space advertising, promotional hype, and the use of direct mail to reach specialized audiences. He stressed the absolute necessity of creating a market identity, illusory as it may seem to be. Working on the principle of experiential familiarity,

AAPG has created the Bookstore. The AAPG Bookstore does not actually exist; it is a deliberately conceived illusion, a travelling exhibit reminiscent of a college library. Such a familiar illusion serves as a psychological "in" to reach potential customers who can generally identify themselves with the college life style the exhibit projects. The reading public needs psychological markers; a publisher's logo, for example, indicates stability and continuity to the reader and inspires confidence.

Obviously, relating to the readership goes far beyond the mere production of an article or book.

#### **Navigating the Verbal Debris Zone**

The image an organization or governmental agency transmits is very often set by its press release policy. Rex Gibbons advocated an intelligent and selective use of the press release. Only one in five releases ever gets used by the media. The remainder constitute verbal debris.

The press release is communication in the raw. The response (or media action) to it depends on the image and information conveyed. It is important to know in this form of communication, as with most others, where you are with your audience, what will excite them, what they know and what they will want to know as well as the results you want from them.

The next time you pen a press release, consider the recommendations of Rex Gibbons: 1. Keep it short (a page per topic maximum is suggested); 2. Is the release timely? (Remember old news is no news); 3. Be selective about the subject (Who cares?); 4. Are you directing the release to the media or to the general public?; 5. Eliminate "manderinese"; 6. Be familiar with media deadlines (a newspaper will need a day's lead time while radio and television may be more immediate); 7. Maintain a list of viable contacts; 8. Indicate a follow-up possibility on your release: at the bottom of the page give a number and name to call for further news; 9. Make the effort of calling a news conference.

It is as important to publish clear, informative, cohesive writing as it is to create the organizational image that backs the writing. Good technical writing, according to Jay Fussell (University of Nebraska) is personable, popular, readable, interesting and instructive. A technique such as STOP (Sequential Thematic Organization of Publications) will ensure a guided and intelligent approach to creation of the *image of organized material arrangement* in report writing. As Jo-Anne Hackos (Colorado School of Mines and Comtech Inc.) explained,

authors set up thesis statements on a sheet of paper and organize their documents according to topics and themes instead of typical categories. By setting up thematic modules, identifying lead-in topic sentences and critically organizing the illustrative material, STOP orients the writer. Classical documents tend to use vague headings such as Introduction, Discussion and Conclusions where specific message-oriented subheadings would probably heighten reader interest. Again, the fundamental concept is to guide the reader conceptually and pull him into the information. The outline-module storyboard approach helps the editor get the message in and get the confusion out of a document *before* it gets locked into the writer's style. The document is made reviewable *before* it is written. The outline clarifies themes, helps eliminate repetition, allows the writer and editor to get to the heart of matters. The technique can also be applied to rewrites and is especially useful in task force writing.

#### Government Publishers

Ward Neale (G.S.C. Calgary) reviewed the history of federal geoscience communication and indicated trends which were emerging. The early era of publication emphasized the pragmatic: coal and mineral deposits, hydrology and engineering applications. Reports contained simple sketches with which the public could identify, e.g., G.K. Gilbert's favourite horse or William Logan's favourite tent. Survey officers gave public lectures at frequent intervals and Henry de la Beche of the U.K. Survey had a lecture hall commissioned for just that purpose. Survey reports usually had prefaces that explained clearly, at some length, why the studies had been undertaken. Then followed the dull grey descriptive era which embraced the first half of this century, and was distinguished by dull grey covered tomes produced by surveys around the world. This was an era of heavy editing, rigid formats and abundant jargon. Reports and memoirs became increasingly oriented towards restricted fields of specialists. A change began in the 1960s with the increasing demand for accountability. In most cases, this change has been only cosmetic. Neale showed examples of Canadian, Australian, French and British reports to illustrate that text had changed little and that most federal reports were intelligible to a very restricted readership.

The major exceptions are the reports of the USGS. Examples of that Survey's Circular Series were cited to illustrate successful attempts to reach a wide

audience of potential users outside of the geosciences. The professional paper "Nature to be Commanded" was held up as a classic in technology transfer. The USGS yearbook "USGS '81" and its predecessors of the past five years were held up as models for government agencies to explain their activities to taxpayers and politicians.

In the case of specialist publications designed for a restricted audience, he felt that public awareness and understanding could be achieved by prefaces similar to those that were common in the early days of federal surveys.

John Rold (Colorado Geological Survey) described the published aims and objectives of his operation: "publish when necessary and make your publishing cost-effective". To these ends he gave the following advice: use simple language and illustrations, control cost factors and press-run quantities rigorously, place strong limits on complimentary copies, maintain flexible standards to meet specific goals on specific projects, adhere strictly to deadlines, use vigorous merchandising programmes, update bimonthly and biweekly sales charts, and be shameless in your advertising (e.g. use the back page of a publication to announce future publishing projects).

#### Technologies of Communication

Barbara Hillier and Diane Schnabel made a joint presentation on the word processing capabilities of the USGS Denver office. The NBI System 3000 (Paperwork Processor) and System 8 (Central Processing Unit) are designed to have broad communications capabilities; they interface with other USGS systems through software programmes. For example, the Denver office, by using an OCR (optical character reader) can transmit abstracts and "rush" reports to the Reston, Virginia, centre via the System 8 communications mode. (System 8 means that the central processing unit is capable of 8 simultaneous functions at any given time.)

#### Flooding the Electronic Connections

The key words of the electronic editorial era today are tighten up: tighten up control visually and conceptually and tighten up time and production factors. Editors should use the technology to advantage. Fred Spilhaus (AGU) encouraged editors to get involved with the technology. If you have word processing capability, then you should write a simple programme for a manuscript tracking system to update editorial progress. Spilhaus maintained that by keeping up-to-date manuscript records online the

editor can plan his time more effectively.

The electronic connections are already being flooded with open file reports which are accused of being an electronic dumping ground. Selection of publishable material becomes critical and the review system must be used optimally to ensure that only worthwhile scientific progress is reported. Orrin Pilkey (Journal of Sedimentary Petrology) identified some trends that will have to be controlled by editors so that the circuits don't get overloaded as we move into the age of the electronic journal.

There has been a growth in multiple authorship - editors need to ask who is ultimately responsible for the data presented in a manuscript. Some co-authors write after publication to deny participation in an article or they will deny the conclusions arrived at in their paper! There have been a proliferation recently of small papers (what Pilkey calls J.P.U.s - just publishable units and L.P.U.s - least publishable units). Such informational thin slices pose many problems for editors. To the salami science phenomenon we add the following complications: "shingling" or overlapping topics (verging on plagiarism of one's own work) and "double and triple dipping" (publishing essentially the same paper in several journals), again, plagiarism of one's own work. The information becomes needlessly fractionated and bibliographic databases are overloaded.

#### Some Solutions

The real culprit, of course, is the publishing artist: the person who can make something of nothing and give it a large-scale geological context. Academia has set the tone of publication by counting papers instead of reading them. This leaves editors with the task of distinguishing scope from length and checking content versus quantity. Authors who submit articles to the *Journal of Sedimentary Petrology* are asked to sign a form which states that they are not repeating their submissions elsewhere. Pilkey suggested that editors set up an author credit check: start files on known shinglers and double and triple dippers. The review system must also be efficient and useful. The reviewer, according to Fred Spilhaus, must bear in mind his obligation to represent the reader's interest by not wasting his time.

During the technical writing session, editors Jay Fussell (University of Nebraska) and Wendell Cochran (Geotimes) suggested the standardization of bibliographic style, use of new publication formats such as the STOP technique, the employment of freelancers

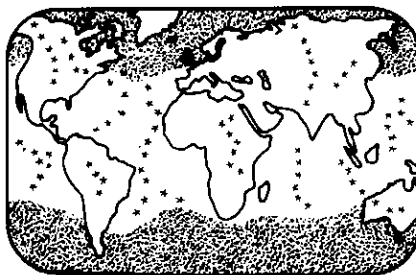
to take care of editorial backlogs, and they emphasized the importance of clear writing. Simply by eliminating the passive voice a saving of 10% in production costs can be achieved.

#### Special Events

Robert Bates was presented the AESE Award for Outstanding Editorial or Publishing Contribution in recognition of his outstanding geocommunication skills. As a teacher, he authored *Geology - an Introduction* (Heath, 1965) and was directly involved in curriculum planning at Ohio State University. He compiled the second edition of the *Glossary of Geology* (AGI, 1980) and has regularly produced the renowned "Geologic Column" of *Geotimes* since 1955. He also became the new president of AESE at this year's meeting, replacing last year's president, Mike Latremouille.

Achievement awards were given out at the annual banquet. Orrin Pilkey shared the Broken Pencil Award with Nancy Dutro of AGI. Orrin's contribution to geological terminology was a word he coined which was picked up by the *New Yorker*: de-Newjerseyization (spelling?). Nancy received hers for a title that would not die. On the contents page of one of AGI's journals, the same title kept reappearing in a number of consecutive issues.

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## Union Internationale pour L'Étude du Quaternaire Rapport du Comité Canadien

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L'année 1981 en a été une de profonde ré-organisation structurelle des associations canadiennes regroupant les spécialistes du Quaternaire. En mars 1979 le Comité associé pour l'Étude du Quaternaire du Conseil national de recherches (CAQR) cessait d'exister. Ceci permit la mise en place du Comité national canadien pour l'INQUA. (CNC-INQUA) et la création de l'Association canadienne pour l'étude du Quaternaire (CANQUA). L'Association québécoise pour l'étude du Quaternaire (AQQUA) existe déjà depuis quelques années.

Le but du CNC-INQUA est de servir de lien officiel entre le Canada et l'union internationale pour l'étude du Quaternaire. Le 2 mai 1980, suivant une recommandation du Conseil canadien de géoscience, le Conseil national de recherche du Canada nommait un nouveau comité, la première réunion de ce comité s'est tenue le 26 septembre 1980 au cours de 4e colloque de l'AQQUA à Québec.

Le rôle du CNC-INQUA vis-à-vis CANQUA a été clarifié. Le comité sert essentiellement de lien officiel entre l'Union et le Canada et il doit promouvoir les objectifs de l'INQUA au pays. Le CNC-INQUA évalue le rôle du Canada à l'intérieur de l'Union, il informe le Conseil national de recherche sur les activités de l'Union et sur la participation canadienne à ces activités. Le CNC-INQUA suggère les noms des délégués qui représenteront le Canada aux assemblées générales de l'INQUA selon les status et règlements de l'INQUA. Le Conseil national de recherche nomme les délégués. Le comité agit comme lien de communication officiel entre l'Union et les sociétés

et scientifiques canadiens. Le comité doit encourager les recherches sur le Quaternaire au Canada en favorisant des études inter-disciplinaires sur la nature du milieu et sur son histoire en tenant particulièrement compte des aspects d'importance globale. Le comité doit, en particulier, assurer une implication des Canadiens dans des commissions de l'INQUA. Il doit voir, lors des congrès de l'INQUA à l'organisation des expositions canadiennes faisant état de la recherche.

CANQUA, par ailleurs, est l'association professionnelle de tous les spécialistes canadiens du Quaternaire. Son but est de promouvoir la collaboration dans la recherche pour le bénéfice des individus et des groupes qui en font partie. CANQUA sert les intérêts des personnes, des groupes et des institutions membres. Lorsqu'il y a convergence de buts avec ceux de l'INQUA, il s'établit un enrichissement des aspirations individuelles par des intérêts internationaux. Fréquemment, de tels convergences et objectifs se retrouvent dans un large éventail, d'où le besoin de liens étroitement structurés entre CANQUA et CNC/INQUA. Les modalités de nominations sur le CNC/INQUA discutées ci-dessous veulent assurer ce but.

La durée des mandats des représentants élus à l'exécutif de CANQUA sera, très certainement, beaucoup plus court que les 8 ans du terme de mandat des membres du CNC/INQUA. Ce mandat de 8 ans a pour but de faire le point entre le cycle de quatre ans des congrès de l'INQUA. Un mécanisme a donc été mis au point pour assurer, sur une base de rotation, une représentation importante de CANQUA sur le CNC/INQUA. Il est accepté que CANQUA fournira éventuellement 8 des 12 membres du Comité national canadien pour l'INQUA. Les 4 autres membres seront nommés sur suggestion du Conseil canadien de géoscience. Cette procédure assurera une représentation des disciplines qui font partie de CANQUA en plus de garantir que les nominations seront faites de concert avec les quaternaristes canadiens.

La suggestion, faite par le précurseur de l'actuel CNC/INQUA, de tenir le congrès de l'INQUA à cette invitation avait été favorable. Il est cependant possible qu'une invitation d'un pays du Tiers-monde, soit reçue plus favorablement que la proposition canadienne. Dès lors, bien que de nombreux quaternaristes canadiens souhaiteraient que le congrès de l'INQUA 1986 se tienne au Canada, il faudra attendre le congrès de Moscou pour connaître la décision de l'INQUA.