

by a gaseous atmosphere. It is affected by energy from the sun causing weather which, over a long period of time, is known as climate.

A major characteristic of Planet Earth is the large amount of water on its surface which affects climate and has resulted in the formation of many observable land forms.

Theme Three: The Past History of the Earth and Saskatchewan

Evidence of earth history can be found through the study of sedimentary rock layers and fossils which enable the layers to be divided into time periods

Theme Four: Man's Utilization of Resources

Renewable resources such as plants and animals require careful management if supply is to be maintained.

Man, through the use of technology, now has the power to modify his world beyond recognition. Major decisions that affect the environment tend to be a compromise between environmental health and man's needs and aspirations.

This process of developing the new curriculum, while at the same time piloting the developed material, was used because of the tight time line. This, together with the material sampling - not everyone testing the whole program - allowed the pilot to be developed and tested over a relatively short period of time. During this time period, from September 1977 until February 1978, besides developing and testing activities, the pilot teachers also reviewed new textbooks and reference materials that could be used with or as a supplement to the new curriculum. This concluded phase one of the curriculum project.

The material developed by the earth science pilot teachers was taken by the Division III Science Curriculum Committee along with their recommendations regarding textbooks and reference materials and organized into the following tentative items. (1) Syllabus - theme outlines and concepts to be taught; (2) Activity Handbook - activities tied to concepts.

These items were completed for use by the pilot teachers in August of this year. This signified the start of Phase Two of the program. During this second phase, all the pilot teachers are to

field test the complete program as developed by them and the Curriculum Committee. This phase is meant only to assist the pilot teachers in preparing for their role as an in-service coordinator during Phase Three of the program in the fall of 1979. This second testing period allowed the pilot teachers to become completely familiar with the tentative program and make suggestions as to necessary changes in the area of additions or deletions. It also allows the pilot teachers to find possible "pitfalls" of the program.

All earth science teachers in the province should receive the following items by February, 1979: (1) Syllabus, (2) Activity Handbook, (3) Instructional Resource Guidebook.

Phase three of the program is scheduled for implementation in September of 1979. The pilot teachers are to be responsible for giving the in-service in their area of the province to assist in the program implementation.

This new program is a step in attempting to give body to the earth science curriculum and the extent of teacher involvement in its development has made Saskatchewan a leader in earth science education. This, together with resource material being developed, both print - Geological History of Saskatchewan, and non print - 16 mm films and filmstrips dealing with many aspects of Saskatchewan should be a valuable aid to future earth science teachers.

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Pyroclasts

Ward Neale

Toronto '78

The GAC/MAC/GSA spectacular was a tremendous success and I herewith publicly doff my hat to chairman *Paul Kavanaugh* and his multitude of co-workers. *Bill MacKasey*, who headed up the field trips, suggested strongly that the hat should be eaten rather than doffed for he remembered the very first of these columns (v. 2, no. 4, 1975) wherein I castigated the GAC executive for consenting to bury their annual meeting among the GSA boards. Actually, it was nearly the other way around with such strong emphasis on the Shield and other things dear to our hearts that several American friends made tongue-in-cheek comments about their delight in finally attending a GAC annual meeting. Chairman Kavanaugh's secret weapon in this whole affair was *Norah Allman*, the meeting's publicity chairman, who started brainwashing us a year in advance so that we read about Toronto '78 in every magazine, journal or newspaper (well certainly in the *Northern Miner*) that we picked up. The stark phallic CN Tower of the logo was stamped so firmly on the national geoscience subconscious that come October no one would think of anywhere else to go.

I still deplore big meetings but if we have to have them let them be like the one in Toronto.

Silver Tongues and Super Slides

One of the drawbacks to large meetings is the innumerable conflicting sessions. One of the few unforgivable flaws of this meeting was the scheduling of the GAC presidential address at a peak time in late afternoon and in an

obscure room, far removed from the major scene of action. *Roger Macqueen*, who has been possibly our most active and visible president of all time, has throughout the past year been heard on CBC and quoted in Science Forum on topics of public concern. He chose, for a change of pace, to give a technical talk slanted towards economic geologists – “Base metal deposits in sedimentary rocks”. The turnout was disappointing as it was the year before in Vancouver when Jean Lajoie gave a similarly slanted presidential swan song. A pity as it was a superb talk by one of the most eloquent geologists of our times – you could have brought even your old mother along and she would have been deeply touched by Roger’s moving account of the migrating pore fluids. Following his address, Roger conducted the annual business meeting of the GAC and persuasively engineered a large (and justified) fee increase without a dissenting voice being raised. Macqueen would make a great minister of finance if he doesn’t aspire to anything higher!

There were good and bad slides in the technical sessions as always but the best illustrated talk I attended had a message for many of us. *Peter Wyllie’s* presidential address to the Mineralogical Society was entitled “Magmas and Volatiles”. You can well imagine what the illustrations might have been: a myriad of triangular diagrams containing a morasse of intersecting curves with all sorts of explanatory notes that couldn’t be read from the front rows. But it wasn’t like that. The diagrams were all very simple and drawn freehand with various coloured thick felt pens and then photographed. Most slides had no lettering on them other than single letters at the corners of diagrams – and of course written words weren’t needed as he was explaining the diagrams. Every now and then the theme he had developed was nicely rammed home by a cryptic hand-lettered sentence shown on a slide, e.g., “Unfortunately the human mind reacts at a much faster rate than the contents of a pressure vessel over a slow burner” to convey the message that outrageous hypotheses were leaping ahead of experimental data. I doubt if any of Wyllie’s slides had taken more than 10 minutes of drafting

time yet they were much more effective than the neatly executed but highly cluttered slides that so often come from institutional drafting offices and professional audio-visual firms. Some of these latter may involve two or more man days of drafting and, despite their exquisite detail and beautiful colour coordination, may have no impact at all during the 15 seconds they are on the screen – due to that very same exquisite detail. Try a felt pen next time you wish to get a message across on the screen.

Airing Underground Secrets

This year’s Canadian Geoscience Council forum was certainly one of the highlights of Toronto ’78. It dealt with the disposal of high level radio-active waste, a subject that has generated more heat than light in recent years. This meeting was a restrained, civilized discussion among experts with very different opinions: government scientists who told us just what they were doing (in many cases for the first time) and industrial consultants and university scientists who told us what others were doing and what they thought should be done. We’ve been slow in arranging such a highly informed scientific debate and the demand for it was obvious – the huge ballroom was filled from 1:00 until nearly 6:00 PM when it ended and the two sessions of audience participation had to be extended and yet still didn’t satisfy dozens who felt they had something to contribute. *Hugh Wynne-Edwards* did a fine job of chairing the session. *Chris Barnes* initiated and organized the whole affair and hopes to have an edited version published (with the aid of GSC) just about the time you are reading this

Watch Out – They Are Right Behind You

The pioneers of our science were a miscellaneous lot: physicians, clergymen, stonemasons, canal engineers and retired naval officers who just included rocks among their less lascivious pleasurable pursuits. But do we want such people to take over again? There is a real danger of this happening and, if it does, what will happen to our annual increments, consulting fees and our status as beneficial mystics in an energy hungry society?

David Suzuki is an obvious source of alarm. He assails the public airways with intelligible accounts of lasers, clones, and black holes. And now he talks of starting science clubs across the country. Some geoscientists have been lulled into a sense of false security because Suzuki and his guests seldom discuss geoscience – apart from the odd mention of continental drift or new prospecting devices – and their hope is that his science clubs will confine themselves to biology, chemistry, physics, astronomy and other irrelevant topics.

Don’t be misled, our own secrets are now being penetrated on a dozen different fronts. For example, the Calgary Herald commonly carries front page stories on geology, using local formation names and discussing porosity, permeability and structural traps as if every reader understood these terms without further explanation – and, unfortunately, they do! After the news last spring of the Elmworth gas find, the Calgary newspapers ran front page explanations of tight sand gas traps. For the first time I felt well-informed on the subject. Unfortunately, so did my neighbours, the retired post-mistress, the electrician and the dairyman. So, despite my new knowledge, I actually lost status because they knew as much as I did

I’ve feared the day when this would happen ever since I worked long ago with isolated Cree Indians and again, much more recently, with Newfoundland fishermen. These rascals knew an amazing amount about rocks from their completely untutored observations: some could draw amazingly accurate maps from memory, others knew or suspected quite as much as did James Hutton concerning the significance of cutting relationships in igneous rocks. However, by skillful use of jargon and complex explanations, one could maintain an upper hand and eventually even quell their natural interest.

Unfortunately, our screen of jargon was temporarily dissipated during the advent of plate tectonics. It came upon us so suddenly that we were bereft of technical terms and had to use simple, understandable words and phrases such as ocean spreading, continental collision and simple analogies such as scum on boiling soup and ice pans at spring breakup. Of course the public

understood everything. To make matters worse, eager authors published in semi-popular and popular magazines such as *Scientific American* and *Endeavour*, sometimes even before they got their first salvos off in *Nature*. These articles were and still are further simplified on the science pages of your weekend newspaper. Chaos reigned from the very beginning. I can recall a journalist calling on a group of experts in 1967 and asking if the divisions of the Precambrian Shield had any plate tectonic significance. Never having heard of plates, the experts were at first amused then, when she had explained the rudiments of plates to them, they were understandably frightened. In later years, when most of us had digested the rudiments of the new theory, it was still embarrassing to address a Rotary or Lions Club and then find yourself challenged in the question period by an erudite farmer or dry-cleaner who had read the latest *National Geographic* before you had got around to it. We are finally establishing a strong, protective jargon in plate tectonics. Let us hope it is not too late.

As I implied at the outset, this rapidly growing public perception endangers not only our status but our livelihood and life style. For example, a group of hydrocarbon experts breezed into a small eastern province a few years ago to pull the usual snow job on the premier in regard to offshore concessions. They emerged pale and shaken after being bombarded with questions about spacing of seismic lines and depth of penetration. Others, after a disastrous performance in front of the quiz kids in their daughter's high school class, have had to forego the much needed relaxation of the company's golf game as they nervously prepare to explain the genesis of ore deposits to the neighbourhood Elk's Club.

The only way to guard what remains to us is to follow the formula that served us so well in the first half of this century, a formula to which our wiser colleagues have always adhered: don't let THEM know. There are two ways to do this. (1) Keep the discussion intellectually and mathematically over their heads. Geophysicists are masters at this. Petrologists are moderately successful even though a guy called Barry Com-

moner dealt them a cruel blow by making thermodynamics understandable to postmen, bus drivers and even to a few economists. (2) If there is no way to be intellectually superior then you can be incredibly dull or long-winded or both by following the proven record of mineralogists, paleontologists and stratigraphers.

Earth scientists have finally achieved a place in the sun, let's not dilute our good fortune by sharing it!

Congratulations

- To *Andrew Miall* of the ISPG who ran a successful international symposium on fluvial sedimentology for the Canadian Society of Petroleum Geologists in the fall of 1977 and had a beautifully bound and edited volume on our bookshelves exactly one year later (CSPG Mem. 5).
- To *Glen Caldwell*, chairman of GAC publications, for bringing out a volume (Spec. Paper 17) that contains the highest quality plates I've ever encountered in a Canadian publication. Too bad that he had to go outside of the country for the printing!
- To an *unnamed professor of geology* who astutely referred his Dean to this column (v. 5, no. 3) wherein his university was listed as one of those which had contributed most papers to CJES over the 1974-7 period. He got his increase in budget – but I hope not at the expense of Physics because they (through geophysics) had contributed most to CJES from that university and rivaling geology for second place were the geography and biology departments.
- To *David Strangway*, the ubiquitous perpetual motion machine, who has been vice president of absolutely everything and is now starting on the presidency route – first with GAC and then what?
- To *Chris Barnes* of Waterloo who has followed *George Mannard* of Texasgulf as president of the Canadian Geoscience Council. Chris is the youngest president in the history of the Council, the first vice president of recent years to ascend directly to the presidency and the first academic to take the helm in over two years. It's easy to score a few firsts in this Council which isn't

ruled by precedent and chiefly addresses itself to doing things that haven't been done before.

- To *Gerard Middleton*, founding editor of this magazine, who has gracefully stepped aside at the height of his success and of *Geoscience Canada's* influence and prestige. He has turned the helm over to Bob McNutt. It is hard to quit when you are winning, the temptation always is to stay on and bask in well-earned glory – but that is not Gerry's cup of tea, he is off to tackle other challenges. Meanwhile he leaves behind a mighty challenge to Editor McNutt: that of bettering the best thing in its field. It can be done so best of luck, Bob.

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