

# **Geological Education: Earth Science Education In Saskatchewan**

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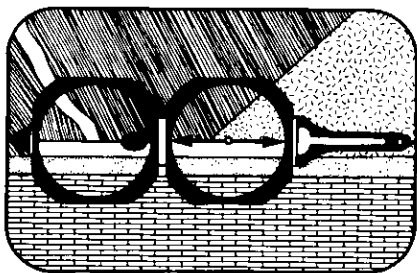
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# Features



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## Geological Education

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### Earth Science Education In Saskatchewan

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The rapid advances of science during the 1960s were echoed in the Saskatchewan school curriculum development through the introduction of a Division III course of studies (1969) which focused on life, earth and space science. School systems and science teachers responded to the need for improving science instruction by implementing the new courses of study and making available a wide range of laboratory and library support resources.

With this premise foremost in the minds of the Division III Science Curriculum Committee, a "new" process was put to a group of Division III teachers who were selected in the following manner: (1) a "good" science teacher, (2) a "representative" teacher who may or may not be in the science field, but who will be teaching in that area.

This "new" program was designed to do the following two things: (1) test a

developmental model; (2) develop a science program.

The pilot group of teachers from Division III were chosen to assist in fulfilling the needs of the past, present and future. The Science curricula are grounded on the necessity to integrate a conceptual understanding of major domains of scientific study: Biology, Chemistry and Physics, with the interests of the advanced student. The accepted themes have been retained in the revised course of studies by focusing on the studies of life, earth and energy. These three areas taken together bring the major conceptual threads of the scientific fabric together in a pattern of interest to students.

Several elements are to be emphasized in the curricula. These include a strong emphasis upon the human component of the scientific enterprise and on scientific processes and modes of inquiry. These elements are evident at each grade level. An emphasis is placed upon the use of the "Saskatchewan example." This does not mean to restrict studies in science to those matters which are only evident in Saskatchewan, but rather to use, insofar as it is possible, examples drawn from the Saskatchewan environment. A final point of emphasis is upon the need to enhance students' scientific literacy. We should give students every opportunity in the classroom to understand science as a mode of inquiry and as a way of viewing the world. The whole value of this revised course of studies and science teaching will have to be judged by the extent that we, the science teachers, provide opportunities for our students to: (1) become and remain interested in science as an area of study; (2) become familiar with their own environment; (3) become literate consumers of scientific know-

ledge and technological advances.

Trying to accomplish these goals, the pilot teachers were brought together in September of 1977 to be presented with the broad thematic outlines and guidelines to be followed to assist them in developing activities for a new curricula. In all there were approximately forty pilot teachers with eleven of these working in the Earth Science area. These eleven pilot teachers were assigned one or part of one of the following themes to develop.

#### **Theme One: The Universe**

Man's concepts about the universe undergo constant revision due to new information provided by optical and radio telescope, spectroscopic studies, and artificial satellites. Theories such as the "Big Bang", "Steady State," and those found in man's religions have been advanced to explain its origin.

Matter is more densely concentrated in the regions of the universe known as galaxies which are composed of large numbers of individual stars. The sun is a typical middle-aged star at the center of a planetary system known as the solar system. Recent manned and unmanned space probes have provided much new information that remains to be incorporated into man's understanding of the solar system.

#### **Theme Two: The Earth**

Most explanations about the nature of the lithosphere deal with the formation of crystals, the properties of minerals, and various physical factors which interact to form the three basic rock types: igneous, metamorphic, and sedimentary. These rocks are constantly being transformed from one type to another, through a series of changes known as a rock cycle.

The surface of the earth is enveloped

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

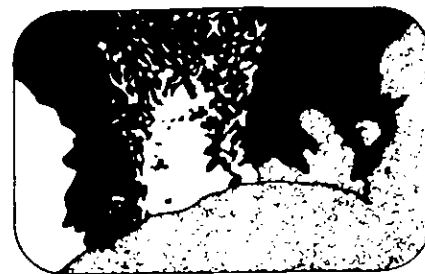
field test the complete program as developed by them and the Curriculum Committee. This phase is meant only to assist the pilot teachers in preparing for their role as an in-service coordinator during Phase Three of the program in the fall of 1979. This second testing period allowed the pilot teachers 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.

MS received November 29, 1978



## 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