

# Geological Education: English-Language Earth Science Education in New Brunswick Schools

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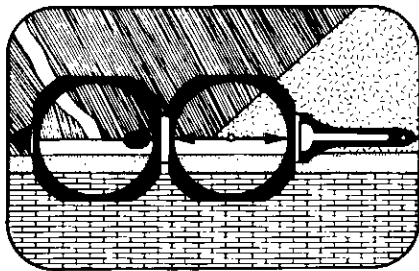
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# Features



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## Geological Education

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### English-Language Earth Science Education in New Brunswick Schools

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It is a sobering thought to realize that within three years the Usher report on earth science education in Canada will be a decade old. While the topic has been the subject of several articles in past issues of *Geoscience Canada*, there has been little opportunity for the profession to judge whether improvements in earth science education are being made within the individual provinces. By indicating some of the work being accomplished within New Brunswick's English-language schools, as well as by outlining the variety of earth science programs for teachers studying at the University of New Brunswick, it may be that educators in other provinces will be prompted to report on their efforts.

New Brunswick's Department of Education has long accepted that the earth sciences do have a place in preparing each student for a life of challenge and change upon graduation from school. In the mid-sixties, the thrust

began with the reorganization of the geography syllabuses for junior and senior high schools. For much of that time, a professional geologist (with a doctorate) served as consultant on the Department's geography curriculum committee. The program, as originally conceived and only slightly modified today, introduced children to physical geography in grade nine on one of three levels, or streams (enriched, college preparatory or general/occupational). Upon entering senior high school, geography became an optional subject which could be taken in grades 10 (physical), 11 (World regional) and/or 12 (Canada).

With the New Brunswick Teachers' College becoming incorporated into an enlarged Faculty of Education at UNB in 1973, as well as geography having been established as a separate entity at Mount Allison University, earth science education within the Province entered a new era. The provincial Department of Education concurrently developed new programs of science and social studies at the junior high school level (now extended into the elementary schools) by which greater emphasis was placed on the outdoor education of children. Even more recently, environmental studies have become an optional sequence within the science programs (biology, chemistry and physics) available at senior high school level. As was the case earlier in connection with teaching geography, a geologist (this time with a B.Sc.) was appointed to the membership of the provincial environmental science curriculum committee.

The subsequent problem facing the University of New Brunswick centered on the need to provide classroom teachers with the principles of and instructional strategies for life, social, physical, earth and environmental sciences. The opportunity to accomp-

lish these objectives was furnished by the newly-introduced provincial regulations requiring all teachers to upgrade their professional qualifications at least to the level of a baccalaureate by the end of the decade. The mechanism chosen was to develop two complementary courses, each of four weeks duration (i.e., about 180 instructional hours each) designed for presentation in off-campus locations during the University's annual Summer School.

In the initial course, titled "Integrated Environmental Science", the current pattern is a class of up to sixty teachers from elementary and junior high school levels studying a variety of topics in very practical ways. At the start, the teachers are divided into two major instructional units, each with its own timetable and within which the participants are encouraged to form small working groups of four or five individuals. Films, experiments, projects and daily field trips intermix theory and practice of local history, art, crafts, photography, outdoor life skills, ecology and forestry, etc. Individual topics are examined under the guidance of an appropriate specialist; each of the four weeks end with a seminar, presided over by an expert in curriculum, stressing applications to classroom situations.

Practical considerations make it impossible to do more than introduce the earth sciences into the Integrated Science course. Only two days for each division are allotted the subject and earth science is scheduled towards the month's end, a time when course participants are physically tired and close to intellectual exhaustion. Nevertheless, the teachers readily understand the rock cycle concept, as well as the relationship between surficial deposits and soils for farming, or forestry. Through the well-annotated field trip(s) which usually span two of New Bruns-

wick's five major landform regions, they also appreciate the opportunity to see how these concepts relate to their area of the province. Indeed many become so stimulated that they register for evening courses given by full-time and/or part-time faculty of the Department of Geology at both campuses of UNB, or at the several off-campus locations scattered through the province regularly served by the University.

Participants in the second course "Ecological Science for Teachers" are drawn from elementary through to senior high school levels. Registration is limited to approximately 50 individuals, otherwise the course is organized along much the same lines as the Integrated Science course. Using discovery/simulation methods, five days are devoted to earth science topics during the first, or second week of the program. Subsequent studies of fresh water and (where appropriate) salt water ecology follow, together with a forest study.

Among the topics examined in the earth sciences portion are geological time, the rock cycles (including basic mineralogy, petrology and paleontology) and the external processes (weathering, rivers, groundwater, ice, wind and the sea). All are related to elementary plate tectonic theory and seen in the context of provincial and/or local geological history. Films and laboratory experiments, together with daily field excursions, or outdoor projects form a comprehensive educational package designed to complement the ecological segments and environmental problems (air, water, solid waste disposal) followed later in the month-long study.

At the same time, the geological section illustrates the chapters devoted to the earth sciences in the science text used by English-speaking junior high school students in the province. Their teachers thus return to the classroom armed with an extensive set of mimeographed notes constituting, in effect, a very practical Teachers' Manual relevant to the local and provincial scenes. In any event, and this is shown by substantial enrolments in further geology/geography courses, all participants are encouraged to maintain permanent contact with the instructor.

The Ecological Science course represents a compromise between the month-long earth science workshop

available annually at the University of Western Ontario and the community-based weekend EdGEO workshops described by Winder (1978). Recent logistical and financial setbacks, combined with the success of the UNB-sponsored courses, have prevented the latter approach in New Brunswick. In the late 1960s Mount Allison, with considerable, but short-lived success staged several month-long earth science courses. While popular with the participating students, the program could not be sustained. Enrolments declined to uneconomically acceptable levels when difficulties were experienced in gaining acceptance of transfer credits by other universities, or from the teacher accreditation sector of the New Brunswick Department of Education.

By contrast, the UNB approach has been successful on both counts. In the six summers since their initiation, one or both courses have been given at Saint Andrews (twice), Saint John (three times), Bath, Dalhousie and Chatham, N. B. After the "integrated Science" course is held this summer at Fredericton, over 400 teachers will have been exposed to this approach. At the same time, more than 300 will have attended the "Ecological Science" course, with both courses due to be phased out in the next few years, the time has come to assess their impact and value on the New Brunswick educational scene.

Plans are underway to develop a questionnaire designed to determine if and how former participants are using the information gained in either, or both courses. Of particular personal concern naturally, are the answers to questions assessing the Ecological Science course. Favourable responses may result in being able to demonstrate to UNB administrators the value of teaching teachers about ecology and the earth sciences within the Graduate School by means of one, or more field-oriented courses.

In reviewing the position of earth science education within New Brunswick schools there is one further concern. Until recently there has been no easy way of providing teachers and their students with suitable written material slanted towards the provincial scene. That situation is changing.

Recently a new publication, titled the Journal of the New Brunswick Museum, has appeared. Published annually, the

Journal is distributed throughout the province, going to individual members of the Museum and to public libraries. In addition, a copy is lodged in each of the several hundred New Brunswick Schools. That opportunity has been quickly seized. The forthcoming issue will contain a paper (Gordon, 1979) dealing with the subject of earthquakes in the province.

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