



Field Workshop in Earth Science Education

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Introduction

The idea of a field workshop for Earth Science teachers developed out of the interest stimulated at the summer Earth Science Workshop that is held annually at the University of Western Ontario during the month of July. Upon returning from the Western workshop I approached a colleague who had attended the previous year and presented him with my ideas and in essence our workshop was born. We established our goals and objectives and set out to acquire the assistance needed to achieve these goals and objectives.

In our initial sounding of local resources, the Saskatoon Board of Education, Saskatchewan Teachers Federation, and the Department of Curriculum Studies, College of Education, University of Saskatchewan responded to our plea for assistance. Although they were initially apprehensive about the success of our workshop, they were willing to provide us with the moral support needed to begin our quest. This was all that we needed and with letterhead prepared by the University Printing Services we put our plans into motion. A total of 40 letters were sent out, although our first appeal did reach more than these 40 sources of possible assistance, as this letter was passed on to other sources. From these 40 initial inquiries, we received 33 replies of which there were 21 of a positive nature.

In setting the goals and objectives for our workshop, it was felt that we could achieve success if we could acquire \$5,000.00 as working capital. It was above our expectations when we received donations to a total of \$7,000.00. The majority of this fund was supplied by the Canadian Geological Foundation in the form of a \$5,000.00 grant. The financial assistance was only part of the necessary requirements in order for the workshop to be a success. The other important assistance that we received was from the technical people who we used as leaders during our planned field trip. These people included Dr. E. A. Christiansen, Saskatchewan Research Council; Dr. A. Stanley, Department of Environment, Inland Waters Branch; Field Staff, Institute of Sedimentary and Petroleum Geology; and a number of others who gave assistance and guidance.

Following the receipt of financial assistance and offers of technical assistance, we proceeded to canvass for potential participants in our workshop. 150 application forms were sent to two general sources, the former participants in the University of Western Ontario workshop and a number of selected School Boards across Canada. From these applications we received 35 replies of which 29 were firm commitments, although as the date for the workshop approached this number was reduced to 20 actual participants.

The type of workshop that we planned was one where the idea of a travelling vacation was built in. Participating teachers would travel with their families and camp along the route of the field trip. Our initial planning had set a budget of \$5,000.00. This amount provided \$2,500.00 for travel, \$1,500.00 for accommodation, Registration, Banquets and Miscellaneous, and \$1,000.00 for Teaching Aids, Honorariums, etc. In actuality our final expenses for the workshop were as follows:

Travel	\$2,737.00
Accommodation	499.68
Teaching Aids, etc.	1,889.00
Total	\$5,125.68

With the final bills paid, the \$7,000.00 of donated funds, plus a registration of \$5.00 per participant left a surplus of \$1,974.32 in the field trip account for further field trips of this nature.

Outline of Activities

The following is an attempt to review 18 days of field tripping. It is difficult to relate the spirit of enthusiasm and involvement that was generated, but it is the hope of the evaluators that through this form of communication we might to some degree convey our appreciation to those people who make this Earth Science Workshop possible.

It is our belief that the success of this first attempt was greatly due to the following aspects: excellent resource personnel throughout; the workshop involved the entire family in that we camped as a group and some time was devoted to family activities; and also there was a strong sense of commitment on the part of each participant.

The teachers that attended the workshop had varied backgrounds in terms of Earth Science training and therefore it will be impossible to report on the level of instruction and discussion during the workshop. At the same time it was evident that the resource persons met this varied interest and understanding in the approaches that they took.

The first day was spent (in Saskatoon) in familiarizing ourselves with the programme and other participants and this was accomplished through registration and a social event.

Our field work began on day two following an orientation at the Saskatchewan Research Council. The field trip was a concentration on the "Physical Environment of Saskatoon". This involved a study of an exposed river bank correlated with samples taken from a drilling unit a few miles away. The trip ended with a panoramic view from Mt. Blackstrap.

The third day was spent at Central Canada Potash Company, Colonsay, Saskatchewan. The mine was not in operation at the time and thus we had considerable freedom to move about underground giving us an excellent insight into the mining operation and the earth structure below the surface.

Day four was spent on the University campus with a particular Geology class and viewing a display of teaching materials. The activity with the class involved viewing a geological film.

Day five was devoted for travel to Drumheller.

Day six was a very rewarding day in Drumheller and district. The Badlands

proved to be very rich in Geological history. It was here we could see the Hoodoos, exposed coal seams, bentonite shale, oyster beds, roadside outcrops displaying perfect varves, and dinosaur remains.

The seventh day was a day for travel to Calgary.

Day eight Husky Oil Exploration presented us with information regarding their interests throughout the world, methods used by their company in locating possible drill sites, and the total analysis procedure. This particular tour as well as two others showed the relationship between oil exploration and geology.

Day nine was open for family activities (e. g., visit the planetarium).

Day 10 involved a tour of the Institute of Sedimentary and Petroleum Geology and a tour of Chevron Standard Exploration. At the institute we received a basic outline describing the nature of the geological areas to be toured during the next three days (this proved very beneficial in the complex structure of the mountains) as well as some insight into the role of the Federal Government regarding geological data of Canada. We were able to see some of the research areas, core analysis labs and the library facilities. The tour of Chevron Standard showed the competitive nature of the industry, the geological data produced by these large corporations and the highly skilled personnel involved in their total programme.

Days 11, 12 and 13 were completely devoted to a concentrated study of the areas from Calgary to Banff, Banff to Golden, and Banff to the Athabaska Glacier respectively. This field work took us from the Plains, through the Foothills, through the Front Ranges, the Main Ranges and finally to the Western Ranges. We noted that in the east the flat lying sedimentary rocks lie under the plains layer upon layer, thousands of feet thick. In the foothills the rocks are broken into steeply dipping slices, tilted so that each layer dips to the west and uplifted so that rocks are brought from the depths up to or close to the surface. The Front Ranges are made of slices of severely folded and faulted rocks which are uplifted and eroded so that layers that were once deep beneath the earth are now at the surface, and in the valleys older rocks may be seen lying on top of younger rocks along each of the fault

planes. The Main Ranges of the Rocky Mountains, west of the Front Ranges, are cut into masses of sedimentary rocks which have not been severely folded but have been uplifted high into the air. Erosion has stripped off younger rocks and today we can see the flat lying older rocks high in the peaks. The Western Ranges are cut into fractured and folded younger rocks.

Day 14 involved Glacial Geology with a tour of the Columbia Icefield. We could see the Icefields rimming the mountains and in the valley the Glacier that was being formed by the refreezing together or reconstitution of ice and snow. In the bottom of the valley a great mass of rock waste, tongues of ice, meltwater streams and sharp-ridged lateral moraines could be seen.

Day 15 and 16 involved some free time and travel to Edmonton.

Day 17 was taken up with a visit to Schlumberger Field Office in Edmonton. This particular tour left us with little doubt that this company has an important role to play in oil explorations.

Day 18 marked the end of the workshop with a social evening.

Since the workshop in August of 1973 there has been a concentrated effort towards educating the Earth Science teachers of our own local or region. Several ventures have been planned and held. In the fall of 1974 and 1975, field trips were held with emphasis on the "Physical Environments of Saskatoon"; these trips were lead by Dr. E. A. Christiansen. The purpose of these two trips was to provide the oportunities for Saskatoon teachers to become familiar with the Physical Geography and Geology of Saskatoon. Also in the fall of 1975 a joint Mathematics and Science symposium was held and our group chose to provide \$500.00 to the symposium for the purpose of bringing Earth Science resource people for the symposium. In May of 1976, the Field Workshop has initiated what we hope will be a series of annual field trips under the guidance of Dr. E. A. Christiansen. These field trips will follow the format of Dr. Christiansen's Meadow Lake Geolog which was the trip we took on the second week-end in May. A group of 28 Earth Science people from Saskatoon, including teachers and resource people from K.I.A.S.S. and Saskatchewan Research Council, travelled to Meadow Lake Provincial Park where we met by

five teachers from Meadow Lake. The workshop objective is now beginning to be realized. The interest being shown by the resource people provided by Dr. Christiansen is excellent and because of this, trips are being planned for LaRonge and Fort Qu'appelle in the future. The cost of these ventures have been covered in part by teachers and by the 1973 Workshop surplus.

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