THE ALBERTA SCIENCE TEACHER

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From the Editor

Sasquatch is alive in my Grade 9 science classroom. It's not really surprising—government agencies have been hiding him and aliens for some time now. If it weren't for the aliens' very clear communication attempts in the form of crop circles, their existence would be the best-kept secret in history. I am not blaming Alberta Education, which has certainly been kept in the dark along with the rest of us.

Every year a new batch of students presents me with the innocent question, "Mr Collins, do you believe in aliens?" In my usual response, I try to encompass the vastness of space and time and introduce my students to big questions such as, "Why do you think the universe is so big if it is just for us?" I even mention the famous Drake equation, which uses probabilities to calculate the number of advanced civilizations that may exist in the cosmos. My ultimate answer: "Yes, I believe in aliens. I'm just not convinced that they have travelled billions of miles to play in our crops and probe the odd hiker."

This year, for the first time, a student asked me the same question about sasquatch. The student was as determined to convince me of the existence of sasquatch as I was to teach the class about the Bohr model of the atom and its relationship to the periodic table. I had to turn the student's question into a teachable moment.

Fortunately, the model of the atom is a great place from which to launch a discussion on the concept of theories. How has our understanding of these tiny atomic particles evolved? They are not something we can see directly; we can only observe the evidence. And there has been lots of evidence over the years that has forced us to change our view of atomic particles.

I tried to take my class on a similar journey with sasquatch. I challenged my students to find evidence of sasquatch's existence. Two boys came back with several pages printed from the Internet.

"See, Mr Collins. These people say that there is lots of evidence."

"Who are these people?" I asked.

"Them. You know. The ones who found it."

"Found what?"

"The evidence."

And so we danced around stories of strange sounds in dark forests and eyewitness accounts of blurry, furry objects. Of course we looked at pictures of large footprints. Having just heard Michael Shermer, editor of *Skeptic* magazine, speak at the Science Council's centennial conference, I felt confident and able to take on this challenge.

Table of Contents

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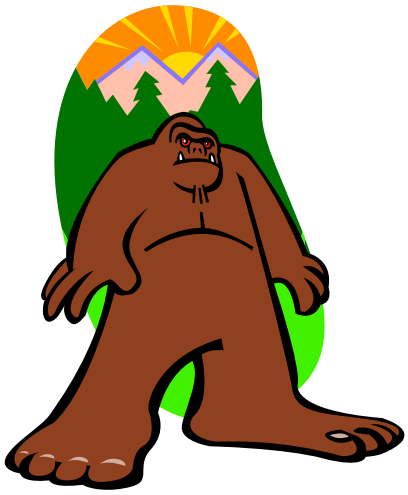
I think that progress was made. I was at least able to get some students to see the value of sharing findings with others. They developed an appreciation for the analysis of evidence, and many even began to look at websites more critically.

The hardest thing for me to deal with in the classroom, though, was the fun that such stories are. I was not reminded of this until late December, when I stopped by our neighbourhood coffee shop and used bookstore. The owner showed me a worn copy of Erich von Däniken's *The Chariots of the Gods*, which explores the idea that our civilizations are the result of alien colonization, using many pieces of historical "evidence." The book first captured my attention many years ago, when I was in junior high. I now realized that it might not have quenched my thirst for science, but it did feed my appetite for science fiction and fantasy. Many hard-core scientists speak about being inspired by tales of alien invasions, haunted houses and strange creatures.

That's why I've learned to live with the large, hairy beast who hides behind my beakers and only reveals himself to my students.

Derek Collins



Alberta Education Science Programs Update

Elementary Science Needs Assessment

A review of the current English and French elementary science programs and resources was initiated in November 2005 as a first step toward renewal of the programs. Regional focus-group meetings were held from November 2005 through January 2006.

English and French questionnaires, currently posted on the Alberta Education website, were a second means of providing input. The English version is available at www.education.gov.ab.ca/k_12/curriculum/bySubject/science/sciquest.pdf, and the French version is available at www.education.gov.ab.ca/french/sciences/Questionnaire_sc_elem.pdf. Responses received up to January 14 will be included in the final summary.

A compilation of the input from the focus groups and the questionnaires will be available in early 2006. The current schedule for development is based on optional implementation of a revised program in September 2009 and provincial implementation in September 2010.

For more information, contact Caroline Nixon at caroline.nixon@gov.ab.ca or (780) 427-9593, or Bernie Galbraith at bernie.galbraith@gov.ab.ca or (780) 422-3218. (To be connected toll free in Alberta, dial 310-0000 first.)

Science 10 Distance Learning Material

The new Science 10 distance learning course is now available. The course consists of four student module booklets that use real-life contexts to introduce new concepts. The associated electronic teachers' guide contains classroom teaching suggestions, assessment guidelines for the assignments, and a final test and answer key. In addition, the guide presents a module project or case study for each module. With the electronic version, the module project, case study and assignment booklets can be readily customized for unique learning contexts. A multimedia CD is included with the first student module. The multimedia components illustrate and reinforce selected concepts in a way that reaches out to students who have a predominantly visual learning style. The Science 10 module pack, the *Addison Wesley Science 10* textbook and the electronic teachers' guide are all available from the Learning Resources Centre (LRC) (www.lrc.education.gov.ab.ca).

Science 20–30 Implementation and Resources

Resource development for the Science 20 textbook and teachers' resource is nearing completion, and those resources will be available from the LRC this spring. The resources are being custom-developed for Alberta Education by classroom teachers who are also field testing the material with their students. A digital version of the textbook (titled *Science 20 rEsource*) can be downloaded at no cost from Alberta Education's Tools4Teachers website (www.tools4teachers.ab.ca).

The provincial implementation dates for Science 20 and Science 30 are September 2006 and September 2007, respectively. The program of studies is being reformatted to be consistent with that used in the core sciences. It will be posted on the website in early spring.

For more information about the program, contact Caroline Nixon at caroline.nixon@gov.ab.ca or (780) 427-9593. For more information about resource development, contact Maureen Stanley at maureen.stanley@gov.ab.ca or (780) 427-7499.

Field Testing of the Biology, Chemistry and Physics 20–30 Programs of Study and Resources

Teachers are just wrapping up field testing of the revised Biology 20, Chemistry 20 and Physics 20 programs and draft resources, and the 30-level field testing will follow. As the teachers are field testing the 20-level resources, publishers are completing work on the drafts of the 30-level resources. Upon completion of the 30-level field test, the publishers will integrate the feedback from the field test and reviews and combine the material into a 20–30 text. The student and teacher resources are scheduled to be available from the LRC in early 2007.

The revised Biology 20, Chemistry 20 and Physics 20 programs of study are scheduled for implementation in September 2007, followed by the 30-level programs in September 2008. The year between field testing and provincial implementation will allow time for textbook development, printing, distribution and purchasing. Teachers who have participated in the field testing of the revised programs will have to return to teaching the current programs until provincial implementation, because the diploma examinations reflect current programming.

For information related to the English program, contact Caroline Nixon at caroline.nixon@gov.ab.ca or (780) 427-9593. For information related to the French program, contact François Lizaire at francois.lizaire@gov.ab.ca or (780) 422-7992.

Diploma Examinations

Chemistry and Physics

In conjunction with the implementation of the new Chemistry 30 and Physics 30 programs in September 2008, Alberta Education's Learner Assessment Branch (LAB) is currently consulting with teachers and other stakeholders regarding the design of the Chemistry 30 and Physics 30 diploma examinations. The first diploma examinations for the new programs will be administered in January 2009.

LAB staff have surveyed teachers at marking sessions, at meetings for item-writing committees and examination validation committees, and at teacher conferences for opinions, feedback and suggestions regarding the structure of the diploma examinations. This information was shared with stakeholders at the annual Diploma Examination Advisory Meeting in November 2005.

Two options are being considered for the chemistry and physics diploma examinations:

Option 1

- Increase the weighting of the written-response section (Part A) to 35 per cent.
- Decrease the weighting of the machine-scored section (Part B) to 65 per cent.
- Keep the holistically scored written-response question exactly as is.
- Replace the other written-response question with two shorter questions (two major concepts each). One question would be a skills-based question, and the other would be an analytical question. Each response would be read once by a teacher during the scoring process.

This option would allow Part A of the diploma examination to cover a wider range of program outcomes than the current Part A covers. The amount of time needed to write Part A should not need to be increased.

Option 2

- Keep the examination as is, with Part A (worth 30 per cent) consisting of two questions, and Part B (worth 70 per cent) consisting of 56 questions for Chemistry 30 and 49 questions for Physics 30.

In their feedback, teachers and stakeholder groups have indicated that they are in favour of the slight changes found in Option 1.

Field tests will be conducted in January 2006 to verify that the time needed to write Part A (as put forward in Option 1) falls within the current amount of time given to write Part A. Teacher and student participants will then have the opportunity to share their thoughts on the new format.

Consultations will continue on the examination design for the new programs. Input may be given directly to the examination manager responsible for the subject area. After consultations have been completed and a decision has been finalized, schools will be informed by letter and through the annual bulletins.

Biology 30 and Science 30

The Biology 30 and Science 30 programs have not changed as much as the Chemistry 30 and Physics 30 programs. Surveys of teachers in these two subjects have supported retaining the current examination formats. As a result, no changes to the diploma examinations in these two subjects are currently being considered.

French Resources

The Biology 20–30 student and teacher resources developed by McGraw-Hill Ryerson, the chemistry resources developed by Thomson Nelson and the physics resources developed by Pearson Education Canada will be translated and contextualized into French. The student resources will be ready in time for the implementation of the 20-level core sciences in September 2007, with the teachers' guides to follow. The Science 10 and Science 14 teachers' guides should be available from the LRC shortly. Preparations for the translation and contextualization of *Safety in the Science Classroom* are in progress.

For more information, contact François Lizaire at francois.lizaire@gov.ab.ca or (780) 422-7992.

Knowledge and Employability Courses

The Integrated Occupational Program (IOP) is transitioning to Knowledge and Employability courses. Provincial implementation of the new Knowledge and Employability policy, courses and provincial achievement tests will take place in September 2006. The current IOP policy will remain in effect until then. The proposed Knowledge and Employability draft policy is posted at www.education.gov.ab.ca/k_12/curriculum/bySubject/iop/default.asp.

The revised certificate of high school achievement will require students to complete Science 26 and Math 26. The September 2005 field test drafts of the Science 8–9 and Science 16–26 programs of study are available at www.education.gov.ab.ca/k_12/curriculum/bySubject/iop/default.asp.

The following changes are reflected in the proposed Knowledge and Employability policy:

- A series of courses rather than a program
- All courses allocated five credits
- Additional criteria for enrolling students
- A name change from Integrated Occupational Program to Knowledge and Employability courses

Moving from a program to a series of courses will increase flexibility and allow students to enrol in courses at their highest level of achievement. Students will also be able to take a greater variety of courses and become more prepared for the workplace and post-secondary opportunities.

The Knowledge and Employability Studio is a guide to implementation that supports Science 8–9 and Science 16–26. The studio provides information, strategies, sample activities and tools to help teachers meet curriculum outcomes and enhance student learning. It is available at www.LearnAlberta.ca in the Teachers section.

The science component of the studio is organized by grade and further divided into units that reflect the program of studies. The units contain content and suggested activities that provide a framework for learning and a starting point for students to pursue research-based inquiry or hands-on investigation. The material is intended to supplement other resources teachers may use to meet curriculum outcomes.

Authorized science resources (basic, support and teacher) can be found at www.education.gov.ab.ca/k_12/curriculum/bySubject/iop/iopres.pdf. The Authorized Resources Database at www.education.gov.ab.ca/lrdb/ will contain the most recent additions.

For more information, contact Michelle Micklich at michelle.micklich@gov.ab.ca or (780) 415-4508.

Safety in the Science Classroom Resource

Safety in the Science Classroom is scheduled for release in January 2006. This general safety guidelines manual has been developed to facilitate easy reference regarding legislative regulations and legal responsibilities in promoting safe science practices. The resource is intended for use by many parties, including teachers, lab technicians, administrators, superintendents, students and parents. A copy will be mailed to each school, and the LRC will have copies available for purchase at the cost of production in January 2006. The resource is also available at www.education.gov.ab.ca/k_12/curriculum/bySubject/science/screport.pdf.

For more information, contact Vic Romanyshyn at vic.romanyshyn@gov.ab.ca or (780) 415-8958.

Recently Authorized Resources

A new resource list and annotated bibliography for the Science 7–8–9 program of studies is available at www.education.gov.ab.ca/k_12/curriculum/bySubject/science/scires.pdf.

A new resource list and annotated bibliography for the Science 14–24 program of studies is available at www.education.gov.ab.ca/k_12/curriculum/bySubject/science/sci1424res.pdf.

Hands-On Health Research for Students and Teachers

It's not uncommon for teachers to hear students who participated in the Heritage Youth Researcher Summer (HYRS) Program say that they had the best summer ever. This year will mark the seventh summer of the HYRS Program, and to date more than 250 students have experienced first-hand what it's like to be a scientist.

The HYRS Program, sponsored by the Alberta Heritage Foundation for Medical Research (AHFMR), gives Grade 11 students first-hand biomedical and health research experience at a university campus and introduces them to the many exciting careers available in this field. Students work on health research projects in laboratories at the University of Alberta, University of Calgary or University of Lethbridge. The HYRS Program aims to encourage students to pursue a career in the health sciences.

Because of the important role science teachers play in creating the bright young scientists of tomorrow, AHFMR has also developed the Heritage Science Teacher Workshops—free three-day summer programs for high school science teachers. The workshops allow teachers to conduct laboratory experiments and tour research facilities at either the University of Calgary or the University of Alberta.

Applications for the HYRS Program will be sent out to schools and will be available on the AHFMR website in February.

Applications for the Heritage Science Teacher Workshops will be available at the beginning of May.

For more information about the HYRS Program or the teacher workshops, visit the AHFMR website at www.ahfmr.ab.ca.

PSAC Grant Program

Ten school grants of $1,000 each will be awarded in 2006!

In 2006, the Petroleum Services Association of Canada (PSAC) will award $10,000 in grants to enhance educational opportunities in rural schools. The goal of the PSAC Grant Program for K–12 Schools in Small Communities is to encourage students in western Canada to pursue studies in math and science, and to introduce them to the petroleum services sector and its many exciting career opportunities.

The applicants must be K–12 schools located in British Columbia, Alberta, Saskatchewan or Manitoba communities with a population of 15,000 or less. The applications must clearly address a specific educational requirement relating to math, science, or the oil and gas industry (for example, computer hardware or software, science equipment or calculators). Applicants must provide a description of the project's cost, why it's needed, and who will benefit from it and how. Projects valued at more than $5,000 will not be accepted. Funds awarded must be used in the 2006/07 school year. Schools that submitted applications in previous years are eligible to reapply, even if they received the PSAC Grant in the past.

The 2005 PSAC Grant Program recipients were as follows:

- Mecca Glen School (Ponoka, Alberta)—calculators and physics equipment
- Southeast Christian Academy (Estevan, Saskatchewan)—microscopes, lab supplies and math manipulatives
- Sturgeon Heights School (St Albert, Alberta)—aquarium, bird and lizard cages, animals and supplies
- Unity Composite School (Unity, Saskatchewan)—computer-compatible microscopes
- Wild Rose School (Shellbrook, Saskatchewan)—classroom SMART Board

Completed 2006 PSAC Grant Program applications must be in the PSAC office by **Friday, April 28, 2006.** The rules and regulations, an application form and a promotional poster are included with this newsletter and can also be downloaded from the PSAC website (www.psac.ca) under What's New. You can also apply online. For more information, call PSAC at (403) 264-4195 or 1-800-818-7722 (toll free).

Do You Understand Common Energy Conversions?

"Why do I need to know about this? I'm never going to use it again."

Does this sound familiar? How many times have you heard students, less than enthusiastic about common energy conversion systems, tell you that they're going to be a sales associate, a writer, a baker—and they don't need to learn "this stuff"? Try as you might, you just can't convince them otherwise.

Well, the Science Alberta Foundation has come up with a way to pique the interest of even the most indifferent teen. Its latest science crate, The E-Factor, addresses the Science 24 unit "Understanding Common Energy Conversion Systems" using a catchy storyline and creative activities to *convert* students from uninterested to enthusiastic.

"Kids love this crate," says Julie Guimond, the Science Alberta Foundation's manager of learning projects. "We've completed our first round of student testing, and they really appreciated how the activities put the science into perspective."

Putting the science into perspective is a big part of what the Science Alberta Foundation does, and this crate reflects that goal. According to Guimond, The E-Factor aims to provide real-life applications to science learning. Adding zip to the theme, the activities are set in a pop culture magazine called *MegaWatts*. Each activity station revolves around a brief, catchy article from the magazine—engaging students with fun visuals and digestible information.

"The program offers a chance for students from all over the province to have a meaningful, hands-on learning experience in a specific area of science. This hands-on experience is most important in courses like Science 14–24, where students are more likely to learn by actively participating than by reading," adds project manager Bob Constantin, who has 34 years' experience teaching junior high and high school biology, chemistry and general science.

Seven hands-on activities ensure that students have a meaningful, deep learning experience. Students will compare the fuel efficiency of a compact car with that of an SUV; learn about the financial impact of their lighting and transportation choices; invent a new device that uses a unique energy conversion system; review the processes involved in refining petroleum and producing methanol fuel; explore solar, wind and hydro generators; examine energy conversions in photosynthesis and respiration; and calculate the daily energy balance based on dietary selections.

"During our initial testing, we heard great feedback from the students. Many of these students hadn't thought about the science in their daily lives, and these activities really inspired them," says Guimond. "They really had fun with the activities, while challenging themselves to understand the science concepts."

The E-Factor underwent another classroom testing before the holiday season and is now in the final development stages. The completed crate will be available for booking in early 2006. In fact, the Science Alberta Foundation will be previewing the crate free until June 30.

To learn more about how you can book this crate at no charge, sign up for Science Alberta's new e-newsletter, *Bright Ideas Online,* by e-mailing info@sciencealberta.org. Stay tuned for more new titles in junior and senior high math and science.

The E-Factor is just one of 36 crate topics. To learn more about this unique program or to book a crate online, visit www.sciencealberta.org.

Heather Hudak,
Science Alberta Foundation

HHMI Biointeractive Website

Howard Hughes Medical Institute (HHMI) Biointeractive (www.hhmi.org/biointeractive/) is an impressive website that offers educational activities and free DVDs, videotapes and CD-ROMs.

Check out the following sections in the BioInteractive's Top 5, which provide amazing information about technology in the area of genetics.

Bacterial ID Lab

This activity takes you on a virtual tour through the lab and through the procedure for identifying unknown bacterial cultures using polymerase chain reaction (PCR) and gene sequencing. It explains PCR and gene sequencing very well and in great detail. At the end of the activity, students can submit their sequences to an online bank to identify their bacteria. This activity may be more suited to International Baccalaureate (IB) or Advanced Placement (AP) students, but all students will learn something through working through the involved procedure.

Gender Testing of Female Athletes

This activity provides information about the SRY gene and how females with complete androgen insensitivity syndrome (CAIS) have an XY karyotype but show female physical characteristics. Students must decide whether to qualify or disqualify a female athlete with CAIS based on karyotype, physical characteristics and more. It also reports that these athletes *are* accepted as women in athletic competitions. There are science, technology and society (STS) connections there for sure!

Transgenic Fly Lab

This activity first describes the construction of transposase DNA sources. It definitely goes beyond the curriculum initially, but then it becomes fun to inject the fly embryos to create transgenic flies. At the end, the lab results are not what is expected. This activity is a great way to show students how hard work can be foiled by improper technique.

Science Week Begins with Science Fairs

Over the last four years, it has become a ritual to begin Science and Technology Week with the Alberta Science Fair Showcase—an exhibition of Alberta's finest student science projects. And 2005 was no exception. The Alberta ScienceFair Foundation invited all Alberta students who had participated in the Canada-Wide Science Fair in Vancouver to come to Edmonton on October 8 and 9 and exhibit their projects to the public and the media. Global TV broadcast interviews with the award-winning students on its two-hour morning show.

In the afternoon, Shari Worobey, the foundation's education outreach director, offered a workshop to teachers interested in holding a science fair or encouraging their students to engage in project-based science. Attendees came from as far as Fort McMurray, Fort Vermilion, Calgary and further south. She offered the same workshop to an audience from all reaches of Alberta at the recent Science Council conference. The foundation's website (www.asff.ca) also contains a wealth of information on judging criteria, types of projects and ideas for projects.

Every year thousands of Alberta students engage in this challenging and rewarding activity, and the top students are selected to attend the Canada-Wide Science Fair as Team Alberta. With generous support from Pfizer Canada, all students receive team uniforms, and travel is covered for many of them. The next Canada-Wide Science Fair will be held in May 2006 in Saguenay, Quebec, bringing together several hundred young scientists from all the provinces and territories.

The science fairs are accessible to all students—public or separate school students, homeschooled students or charter school students. For more information or assistance, contact the Alberta ScienceFair Foundation at (780) 489-9182 or asf@interbaun.com.

Kay J Jauch

Bryan and Clay, from east central Alberta, pose in front of their project "Operation Distillation II." Bryan also emceed the 2005 Alberta Science Fair Showcase.

Shari Worobey's workshop for teachers

Physics Shmysics

Once again it is time for curriculum change in Alberta, and that makes some teachers grumpy. Familiar timelines, lesson plans and labs all need to be revamped or, worse, retired. Tests and quizzes that have been fine-tuned over the past decade may no longer hit the mark. It makes one wonder if there is anything about the new curriculum that we should be happy about. Let's consider what has now become the unavoidable reality of physics curriculum change.

As painful as these curriculum revisions may be to some teachers, they are the result of an unusually inclusive process. In the process of curriculum change, teachers, postsecondary representatives, and leaders from industry and professional organizations are invited to suggest minor adjustments to existing programs or propose complete revisions of the programs. The process is thorough and time-consuming, but these proposals then become the basis of recommendations made to the Minister of Education. Far from final, the proposed curriculum then goes to another committee, is shared with the public for their input and finally becomes a draft document.

Even grumpy teachers would grudgingly agree that Alberta is a leader in curriculum on this continent, and perhaps even in the world. Anyone who has attended a national or international science conference can attest to the admiring reactions to Alberta's curricula and standardized testing programs. While teachers in jurisdictions south of the border worry about teaching to the test, Alberta science teachers can be assured that proper curriculum implementation prepares their students for exams.

Let's look at the upcoming changes to the physics program. Our current program has a beautiful flavour of classical physics that evolves into the early particle research of the 1920s. Students receive premonitions of Thompson's experiments with electrons in the unit on universal gravitation and circular motion. They are led from the wave model of light in Physics 20 to the particle model of light in Physics 30, a great plot development for those of us who love physics. There are opportunities to play with cool equipment like sound generators, tuning forks, lenses, Van de Graaf generators, current balances, billiard table collisions and circuits.

As great as all this is, I believe that the upcoming program has managed to improve upon this by focusing on the development of physics, while recognizing that students currently learn significantly more physics in junior high school. In Physics 20, the student will gain an appreciation of classical physics, mechanics and physics process skills. No time will be devoted to optics, because that topic is covered in Grade 8, and teachers will be able to extend the topics of universal gravitation and circular motion into new developments in cosmology. Finally, the conservation laws will form a bridge from energy in Physics 20 to momentum in Physics 30.

The first two units in Physics 30 will hook behind concepts and skills learned in previous years. Teachers should understand that the second unit, "Forces and Fields," will not be a combination of Unit 2 ("Electric Forces and Fields") and Unit 3 ("Magnetic Forces and Fields") of the current program. Rather, it will be a condensed view of how charged particles interact with electric and magnetic fields. In the third unit, students will appreciate the critical importance of the wave–particle duality of light in the context of current atomic theories. The final unit will bring together all the major ideas of modern physics in a general understanding of the standard model.

The new program will give students an excellent foundation in classical physics as well as an appreciation of current advances in cosmology and particle physics. One might criticize the program for not covering many specifics that might be relevant in the context of technological advances in the last century. However, I believe that the new program will accomplish something greater than that: it will give students an excellent general understanding of how physics has developed and what the big issues are, while equipping students who want to pursue physics with a sound basis in skills and conceptual foundations.

Kay J Jauch

Kay J Jauch has taught physics for 15 years and currently teaches at McNally High School in Edmonton.

Science Connections in the Rockies: A Workshop

Science Connections in the Rockies
August 17–20, 2006
Yoho National Park, BC

The Burgess Shale Geoscience Foundation presents this earth science professional development workshop.

The cost is $400 per person and includes three nights' accommodation, meals and lots of resource materials. A guided hike to world-famous fossil sites is an optional extension.

The following are comments from past participants:

- "The best mini–science conference I have attended in six years!"
- "Everything was very well organized."
- "It exceeded my expectations! I received fantastic resource materials to make my lessons more interesting and fun!"
- "I have a much more holistic picture of earth science, and this will allow me to connect all of the topics in my curriculum."
- "The location and setting were astounding!"
- "This was the best use of four days I've seen in a long time!"

The workshop is presented with support from the following sponsors: EdGEO, the Suncor Energy Foundation and the Canadian Society of Petroleum Geologists (CSPG) Educational Trust Fund.

The workshop is limited to 24 participants. Don't be disappointed—register early! For more information, e-mail lisa.holmstrom @burgess-shale.bc.ca or visit www.burgess-shale.bc.ca.

Gene Researcher for a Week 2006: The Rt Hon Ramon Hnatyshyn Youth in Science Initiative

Please note that the deadline to apply for this opportunity has passed. This information has been included so that you can be made aware of the program and keep it in mind for next year.

Do you wonder what it would be like to do cutting-edge genetic research, and learn how genes cause human disease and how scientists find cures and treatments for genetic diseases such as cystic fibrosis, heart disease, diabetes and certain types of cancer?

For the fourth year, Canadian high school students in Grades 11 and 12 will have the opportunity to spend spring break in the genetic research labs of top Canadian scientists. Eligible students are invited to apply for Gene Researcher for a Week—The Rt Hon Ramon Hnatyshyn Youth in Science Initiative.

Why Should You Apply?

For a chance to learn about cool genetic technology!

Genetic technology is everywhere. Have you ever wondered what people on TV and in the movies are doing with DNA? Here is your chance to find out. Students selected for Gene Researcher for a Week could get the chance to work with DNA, RNA and proteins, DNA isolation and purification, PCR, SDS-Page, gel electrophoresis, DNA sequencing and Western blotting.

A Unique Experience

Only 30 students from across Canada will be chosen to spend spring break in the lab of one of Canada's leading gene researchers. If chosen, you will work alongside scientists, graduate students and technicians to plan and carry out experiments. You will learn techniques and procedures that genetic researchers use to study human disease. You will attend lab meetings and get first-hand experience in what it is like to work in a hospital or research institute.

We Cover Your Expenses

The students who are selected will receive a daily transportation and meal allowance. Students requiring air travel will also receive a travel and accommodation bursary.

For more information or to apply online, visit www.cgdn.ca and look under Training. The deadline for applications and reference letters is **December 31, 2005.** If you have questions, contact Leslie Mauro at lmauro@cgdn.ca or (604) 221-7300, ext 110.

Gene Researcher for a Week is an initiative of the Canadian Institutes of Health Research, the Canadian Genetic Diseases Network and Merck Frosst.

Bringing Paleontology to Life

Wow, what a fantastic experience! By looking at the past, we can understand the present and are better equipped to deal with the future. After attending Palaeo Week for Teachers at the Royal Tyrrell Museum in July 2005, I feel more confident and knowledgeable in guiding my students on a journey of scientific discovery—the science of paleontology.

The journey began with a terrific PowerPoint presentation on paleontology. Through this presentation, I came to understand the environment of ancient Alberta and the diversity of life that existed in the late Cretaceous period. This was a perfect introduction to the week's many exciting and engaging activities. From the Seven Wonders of the Badlands guided hike to a behind-the-scenes tour, fossil casting and a simulated dinosaur excavation, there was always something new to learn and experience.

The course was not limited to paleontology, because this discipline is closely related to many other branches of science. A geological valley tour with David Eberth showed us how to recognize and identify rock formations and their significance. We learned that paleontologists are very much like detectives, gathering clues to solve the mysteries of millions of years ago. By looking at rocks and fossils, paleontologists can put the puzzle pieces together to re-create the ancient world.

A highlight of the week was a field trip to Dinosaur Provincial Park, a UNESCO World Heritage site. The fossils in that area are approximately 74 million years old—can you believe it? I was blown away, especially after hiking into the natural preserve with Don Brinkman (head of scientific research at the Royal Tyrrell Museum) and seeing all the fossils and dinosaur bonebeds. Everywhere I stepped were dinosaur bones and fossilized wood. Unbelievable!

To wrap up the week, presentations were given by two museum paleontologists, and we were taken on a guided tour of the museum galleries and shown practical applications for classroom activities. In addition to all the knowledge we gained, we received a comprehensive resource package of books, posters, videos and other support materials.

Palaeo Week for Teachers was a great experience—one I will never forget! Dinosaurs didn't seem real to me before I participated in this program. Now they do. I can hardly wait to share my knowledge with others. I highly recommend that you take advantage of this great learning vacation and attend Palaeo Week for Teachers. Expect a hands-on, interactive and involved experience. You won't be disappointed!

Penny Tyler, Grade 3 teacher, Forsythe Road Elementary School, Surrey, BC

Note: The next Palaeo Week for Teachers will take place August 14–18, 2006, at the Royal Tyrrell Museum in Drumheller. For more information or to register, visit www.tyrrellmuseum.com or call (403) 823-7707 (for toll free in Alberta, first dial 310-0000).

Book Review

A Short History of Nearly Everything
by Bill Bryson
Doubleday Canada, 2003

Bill Bryson's *A Short History of Nearly Everything* has made many appearances on scientific best-seller lists. I try not to take such lists seriously. If I did, my credit card would be maxed out from bookstore purchases. I initially passed on the book. I am not particularly drawn to summary books, because they usually cover topics I am already familiar with from reading *Scientific American* and learning about new theories on the universe's evolution or string theory.

A Short History of Nearly Everything eventually came my way through a generous friend. She felt that a science guy like me would enjoy it. So, out of a feeling of obligation, I began to read it. The first few chapters were what I had expected: Bryson tells the very familiar history of the universe by describing protons smacking into electrons to make the primordial atoms.

But the book quickly makes its way out of that. Much of the beginning of the book is dedicated to geology, an area I'm not as strong in. Though I found the details of how people learned about the continental plates, the inner layers and sedimentation interesting, the best part was the stories about the scientists themselves. The book's strength is how it brings the nature of science to life. There is a tremendous diversity of interactions between the various personalities who form our scientific history. I've read some of the mini-biographies in the book to my Grade 9 science class to show them that science is not done only by nerds with thick glasses who are in love with their calculators.

As with any good science book, the success of *A Short History of Nearly Everything* lies in how the author is able to explain diverse topics in simple language. The writing may challenge and expand a typical student's vocabulary—which is not a bad thing—but most adults will find it easy to read and enjoy.

I would like to submit this review as the first in a series called Books I Would Like Every Science Student to Read. Unfortunately, we have a curriculum to teach and, therefore, cannot pass the hours discussing and learning from treasures like this one.

In the next issue, I intend to feature an old favourite of mine that I rediscovered this fall in an entirely new form. It is definitely another book every student (and teacher) should read.

Derek Collins

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