

# Science, Society, and Heritage Science, Société, et Patrimoine



XVIth Biennial Conference

XVIe colloque biennal

Canadian Science and Technology Historical Association

Association pour l'histoire de la science et de la technologie au Canada

Laval University, Québec City

Université Laval, Québec

25-27 September / Septembre 2009



## **Welcome message from the CSTHA President**

On behalf of the executive and the conference organizing committee I am pleased to welcome you to this sixteenth biennial conference of the Canadian Science and Technology Historical Association. With a keynote address by Suzanne Zeller and Ronald Doel on a very timely topic, and over forty papers by historians, information and museum professionals, scientists, and students, this conference demonstrates the continuing vibrancy of scholarship on the history of Canadian science and technology. Several people worked diligently to make this conference a stimulating experience. In particular, Marie-Claude Rocher, Jennifer Hubbard, and Randall Brooks deserve our thanks. In addition to attending sessions and social events, and chatting with colleagues, I encourage you to attend the association's general meeting. Enjoy the conference and historic Québec City.

Bertrum H. MacDonald  
President

## **Mot de bienvenue du président de l'AHSTC**

Au nom des membres du bureau et du comité organisateur du colloque, il me fait plaisir de vous souhaiter la bienvenue à ce seizième colloque biennal de l'Association pour l'histoire de la science et de la technologie au Canada. Le discours d'ouverture de Suzanne Zeller et de Ronald Doel sur un sujet bien d'actualité, et plus d'une quarantaine d'articles d'historiens, de professionnels des musées et de l'information, de scientifiques et d'étudiants, témoignent de façon éloquente de la connaissance profonde de l'histoire des sciences et de la technologie au Canada. Plusieurs personnes se sont activement affairées pour faire de ce colloque une expérience enrichissante. Nous adressons des remerciements particuliers à Marie-Claude Rocher, Jennifer Hubbard et Randall Brooks. En plus de participer aux séances, aux activités sociales et aux échanges entre collègues, je vous invite à assister à l'assemblée générale de l'Association. Bon colloque et profitez bien de votre séjour dans la ville historique de Québec.

Bertrum H. MacDonald  
Président

## **Conference Organizing Committee / Comité organisateur du colloque**

Randall Brooks, Musée des sciences et de la technologie au Canada / Canada Museum of Science and Technology, Ottawa (Past President, CSTHA / Présidente sortante, AHSTC)

Fathi Habashi, Université Laval, Québec (Local Arrangements / Services locaux)

Jennifer Hubbard, Ryerson University, Toronto (Program Chair / Président du comité de programme)

Bertrum MacDonald, Dalhousie University, Halifax (President, CSTHA / président, AHSTC)

Marie-Claude Rocher, Institut du patrimoine culturel, Université Laval, Québec (Local Arrangements / Services locaux)

Laurier Turgeon, Institut du patrimoine culturel, Université Laval, Québec (Local Arrangements / Services locaux)

## Conference Schedule

### Programme du colloque

**All conference plenary and concurrent sessions will be held in / Toutes les séances, y compris les séances plénières, se tiendront dans Les laboratoires d'archéologie de l'Université Laval, 3, rue de la vieille Université, Québec**

The publishers' exhibit will be set up in the registration area throughout the conference.

Les publications de l'éditeur seront en montre dans l'aire d'inscriptions pour toute la durée du colloque.

### Friday / vendredi ~ 25 September / septembre 2009

**12:00 pm-7:00 pm Registration / Inscription** (Entrance Hall / Accueil : les laboratoires d'archéologie de l'Université Laval)

#### **1:00-4:00 Tours / Visites guides**

- 1) Palais de l'Intendant Archeological Site and Les Laboratoires d'archéologie de l'Université Laval / Site archéologique du Palais de l'intendant et laboratoires d'archéologie de l'Université Laval (Guide: Allison Bain, professeure au département d'histoire, Université Laval)
- 2) Saint-Roch Quarter: Geographic and urban history / Le quartier Saint-Roch : géographie et histoire urbaine (Guide: William Moss, archéologue en chef à la Ville de Québec)
- 3) Old Quebec / Vieux-Québec

#### **4:00-6:00 Choice of Concurrent Sessions / Choix des séances concomitantes**

##### **1a : Santé et technologie dans l'histoire du Canada / Health and Technology in Canadian History**

*Location / emplacement* : Room / salle 320

*Chair / président d'assemblée* : Julien Prud'homme

Vivien Hamilton (University of Toronto): "Technology Without Science: Electro-therapeutics in Victorian Canada"

Delia Gavrus (University of Toronto): "Envisioning Cyclopropane at the University of Toronto: From Scientific Production to Medical Technology, 1925-1940"

Marie-Claude Thifault (Université d'Ottawa) : « Technique et spiritualité en nursing psychiatrique à l'hôpital Saint-Jean-de-Dieu, 1912-1964 »

Jean-Philippe Gendron (Université du Québec à Montréal) : « Techniques chirurgicales et chirurgicalisation de l'obésité au Canada au 20e siècle »

##### **1b: Using Natural and Historical Data 18th-21st Centuries / Les données de l'histoire et des sciences naturelles du 18e au 21e siècle**

*Location / emplacement* : Room / salle 319

*Chair / président d'assemblée* : Jennifer Hubbard

Stéphanie Tésio (Université d'Ottawa) : « Expansion coloniale, savoirs botaniques et pharmaceutiques au Canada au XVIIIème siècle : les travaux de Michel Sarrazin (1659-1734) et de Jean-François Gaultier (1708-1756) »

Diane N. Buhay (University of New Brunswick) and Randall F. Miller (New Brunswick Museum): "Building a Research Library: The Natural History Society of New Brunswick (1862-1932)"

Elizabeth Griffin (NRC Herzberg Institute of Astrophysics): "Managing Historical Science: Creating a Resource Worth Having"

### **6:00-7:00 Reception / Réception**

*Location / emplacement* : Room / salle 419

*Book Launch / lancement du livre* : *Chemistry and Metallurgy in the Great Empires* by Fathi Habashi

### **7:30-9:00 Plenary Session / Séance plénière**

*Official Welcome and Conference Announcements / Mot de bienvenue officiel et annonces* : Bertrum MacDonald

"National History, International Context: Collaborative Research on Circumpolar Science and Environment in the BOREAS Programme"

Keynote Speakers / Conférenciers d'ouverture : Ronald E. Doel (Florida State University) and Suzanne Zeller (Wilfrid Laurier University)

*Location/ emplacement* : Room / salle 320

*Chair / président d'assemblée* : Jennifer Hubbard

## **Saturday / samedi ~ 26 September / septembre 2009**

### **8:30-10:00 Choice of Concurrent Sessions / Choix des séances concomitantes**

**2a: 19th Century Canada: Naturalists, Wine, and the Industrial Revolution / Le 19e siècle canadien : les naturalistes, le vin, et la révolution industrielle**

*Location / emplacement* : Room / salle 320

*Chair / président d'assemblée* : Randall Brooks

Diane C. Zerr and Bertrum H. MacDonald (Dalhousie University): "Nineteenth-Century Canadian Naturalists and Communication Networks"

Richard A. Jarrell (York University): "Justin de Courtenay and Commercial Wine-making in Canada"

Robert Tremblay (Musée des sciences et de la technologie du Canada) : « Vicissitudes du métier de forgeron au Canada à l'ère de la révolution de la vapeur, 1815-1880 »

**2b: Canadian Energy: Electrical Production and Gas Pipelines / Le secteur de l'énergie au Canada : production d'électricité et gazoducs**

*Location / emplacement* : Room / salle 319

*Chair / président d'assemblée* : Elizabeth Griffin

Sylvie Laneuville (Université du Québec à Montréal et Université de Montréal) : « Le patrimoine d'Hydro-Québec, une histoire d'innovations technologiques : le cas du compteur électrique »

Sean Tudor (Canada Science and Technology Museum): "Through the Lens of the Mackenzie Valley Pipeline Project: Society, Technology, and the Environment"

**10:00-10:30 Coffee / Café**

**10:30-12:00 Choice of Concurrent Sessions / Choix des séances concomitantes**

**3a: Astronomy and Women in Science and Engineering / L'astronomie et les femmes en sciences et génie**

*Location / emplacement* : Room / salle 320

*Chair / président d'assemblée* : Randall Brooks

David Orenstein (University of Toronto): "Kepler in Quebec: Resources for the History of Astronomy from the *Seminaire de Québec*"

Ruby Heap (University of Ottawa): "The Making of the 'Problem' of Women in Science and Engineering in Canada: The Emergence of the Issue in the 1970s and 1980s"

Elizabeth Griffin (NRC Herzberg Institute of Astrophysics): "On the History of Women in Canadian Astronomy"

**3b: The Marine Environment: Science, Politics, and Message / Le milieu marin : science, politique, et message**

*Location / emplacement* : Room / salle 319

*Chair / président d'assemblée* : Eric Mills

Jennifer Hubbard (Ryerson University): "Breaching the Silos of Science: Transference of Concepts from Forestry to Fisheries Science"

Stephen Bocking (Trent University): "Putting Facts in Place: Science, Salmon, and the Construction of Space in an Environmental Controversy"

Bertrum H. MacDonald, Peter G. Wells, Ruth E. Cordes, Danielle M. Cossarini, and Julie L. Woods (Dalhousie University): "Reading Environmental Literature: Findings from Studies of the

Publications of Two Governmental Organizations”

Peter G. Wells (Dalhousie University): “A History of Research in Environmental Science and Ecotoxicology at SABS (St. Andrew's Biological Station) - A Brief Perspective”

**12:00-1:30 Sandwich Lunch / Déjeuner**

*Location / emplacement* : Room / salle 419

*CSTHA Executive Meeting / Réunion du bureau de l’AHSTC*

**1:30-3:30 Choice of Concurrent Sessions / Choix des séances concomitantes**

**4a : IREPI Le patrimoine ethnologique et les nouvelles technologies web / Heritage and the New Web Technologies**

*Location / emplacement* : Room / salle 320

*Chair / président d’assemblée* : Marie-Claude Rocher

Laurier Turgeon et François Côté (Université Laval) : « Explorations, approches, méthodologies et outils : présentation de la Chaire de recherche du Canada en patrimoine ethnologique et du Laboratoire d’enquête et d’entrevue multimédia de l’Université Laval »

Célia Forget (Université Laval) : « Inventorier numériquement l’immatériel : le projet IREPI »

Martin Fournier (Université Laval) : « L’Encyclopédie du patrimoine culturel de l’Amérique française et les nouvelles tendances web: du 3D au *Serious gaming* »

Louise St-Pierre (Université Laval) : « Le patrimoine immatériel religieux du Québec : sauvegarder l’immatériel par le virtuel »

**4b: Science and Technology: Research Fostered by Federal Agencies and Quebec Universities / Science et technologie : la recherche encouragée par les agences fédérales et les universités du Québec**

*Location / emplacement* : Room/ salle 319

*Chair / président d’assemblée* : Richard Jarrell

Philip Enros (Environment Canada): “Making the Case for Federal S&T”

Sébastien Piché (Cégep régional de Lanaudière) : « Entre l’université, les besoins technologiques de l’industrie et le développement éducatif des collèges : quelle est la contribution des établissements du réseau collégial québécois à la recherche scientifique et technologique? »

Andrew H. Wilson (Independent Researcher): “Issues in Government-Related Science: The Economic Council and Science; the Science Council and Economics”

**3:30-4:00 Coffee / Café**

**4:00-5:00 Choice of Concurrent Sessions / Choix des séances concomitantes**

**5a: Computers in Canada / L'informatique au Canada**

*Location / emplacement* : Room / salle 320

*Chair / président d'assemblée* : Suzanne Zeller

Scott M. Campbell (University of Waterloo): "Jump Start: A Brief History of J. Wes Graham, Water Skiing, and Microcomputers, 1979-1985"

David Theodore (Harvard University): "'The Fattest Possible Nurses': Computers and the Hospital from the Nuffield Foundation to Cybernetic Serendipity"

**5b: Canadian Automobile Industry / L'industrie canadienne de l'automobile**

*Location / emplacement* : Room / salle 319

*Chair / président d'assemblée* : Bertrum MacDonald

Suzanne Beauvais (Musée des sciences et de la technologie du Canada) : «*« Faite sur mesure pour les Canadiens », Mythe ou réalité ? : l'automobile dans les annonces publicitaires pour le Canada »*

Steve Koerner (Independent Researcher): "Nationalism and Technology: The 'All-Canadian Car,' 1960-1978"

**5:30-6:30 CSTHA / AHSTC Business Meeting / Réunion d'affaires**

**7:30-10:00 CSTHA / AHSTC Banquet / Banquet, Hotel Clarendon**

**Sunday / dimanche ~ 27 September / septembre 2009**

**8:30-10:00 Choice of Concurrent Sessions / Choix des séances concomitantes**

**6a: Medicine in Canada 1860-1960 / La médecine au Canada 1860-1960**

*Location / emplacement* : Room / salle 320

*Chair / président d'assemblée* : Stephen Bocking

Jenna Murdock Smith (Library and Archives Canada): "A Perscription for Pure Milk, Sunshine and Fresh Air: The Ontario Provincial Board of Health and the Exhibition of Tuberculosis, 1911-1929"

Dorotea Gucciardo (University of Western Ontario): "Vibrators, Virility, and Voltage: Electric Medicine in Canada, 1860-1920"

David Pantalony (Canada Museum of Science and Technology): "Nuclear Medicine in Canada in the 1950s: History Through One Artifact"

**6b: Mining, Metallurgy, and Medicine / Mines, métallurgie, et médecine**

*Location / emplacement* : Room / salle 319



*Chair / président d'assemblée* : Robert Tremblay

Fathi Habashi (Laval University): "The Beginnings of Metallurgical Research in Canada" (Part 2 of a communication with the same title presented at the CSTHA conference held in Toronto in 2007)

William W. Culver (Independent Researcher): "Missing Pages in the History of Copper Hydrometallurgy: Five Companies Formed Around an Innovative Technology in 1860s and 1870s"

Simon Pierre Barrette (Université Laval) : « Collection historique en métallurgie extractive et chimie industrielle »

**10:00-10:30 Coffee / Café**

**10:30-11:30 Choice of Concurrent Sessions / Choix des séances concomitantes**

**7a: Technology in Canada's Heritage / La technologie dans le patrimoine canadien**

*Location / emplacement* : Room / salle 320

*Chair / président d'assemblée* : David Orenstein

Andrew H. Wilson (Independent Researcher): "The Diefenbunker"

Larry McNally (Library and Archives Canada): "Canadian Millwrights: Who They Were and Their Role"

**7b: Centres of Learning / Centres d'apprentissage et de formation**

*Location / emplacement* : Room / salle 319

*Chair / président d'assemblée* : Peter Wells

Michelle Hoffman (University of Toronto): "Constructing School Science: Physics, Biology, and Chemistry Education in Quebec and Ontario Secondary Schools, 1884 - 1965"

James Lambert (Université Laval) : « Les lieux de la mémoire scientifique à l'Université Laval : un aperçu »

**11:30-1:00 Sandwich Lunch / Déjeuner**

*Location / emplacement* : Room / salle 419

**Conference Closes / Clôture du colloque**

## Abstracts

## Résumés

### Simon Pierre Barrette : « Collection historique en métallurgie extractive et chimie industrielle »

Afin de mieux remplir son mandat de conservation des ressources documentaires, la Bibliothèque de l'Université Laval a mis en place une collection historique dans le domaine de la métallurgie extractive et de la chimie industrielle. La constitution de cette collection a pour origine un don important d'un professeur retraité. La collection comprend environ 260 titres et forme un corpus distinct dans la bibliothèque. Une page web a été créée afin de mettre en valeur la collection et d'exposer les ouvrages les plus importants.

### Suzanne Beauvais : « « Faite sur mesure pour les Canadiens », Mythe ou réalité ? : l'automobile dans les annonces publicitaires pour le Canada »

L'automobile fut introduite sur le marché canadien au début du 20<sup>e</sup> siècle. Plusieurs manufacturiers existaient alors mais ultimement, trois grandes firmes vinrent à dominer jusqu'à récemment, l'industrie automobile au Canada: Ford du Canada Ltée, General Motors du Canada et Chrysler Canada Inc. Assez tôt dans leur histoire, ces compagnies, filiales et succursales de sociétés mères américaines, réalisèrent les différences de consommation entre les Canadiens et les Américains. Pour obtenir de bonnes ventes, leur stratégie de marketing ira même jusqu'à offrir pendant un certain temps, des modèles d'automobiles uniques pour le Canada, avec des noms tels Montcalm, Niagara. Mais qu'en est-il de leur publicité ? Les annonces publicitaires reflètent-elles cette différence dans leur message, leur iconographie ? Comment les Canadiens s'y reconnaissaient-ils ? A l'instar des allégations sur leurs produits, leur publicité était-elle réellement « faite sur mesure pour les Canadiens » ?

### Stephen Bocking: "Putting Facts in Place: Science, Salmon, and the Construction of Space in an Environmental Controversy"

For the last decade the links between a parasite, *Lepeophtheirus salmonis* (also known as sea lice) and salmon have been a focus of research in British Columbia, as part of a larger debate about salmon farming. This debate has implicated not just knowledge, but the social dimensions of science, including trust in scientists and in institutions, and the authority of diverse forms of knowledge (from the field, laboratory, or modeling). But of particular note has been the importance of a specific place, the Broughton Archipelago, in both the science and the political controversy. As I will describe, this site has played an essential role in debates about scientific evidence, even as the identity of this site as a distinct place has been itself constructed.

### Diane N. Buhay and Randall F. Miller: "Building a Research Library: The Natural History Society of New Brunswick (1862 – 1932)"

The Natural History Society of New Brunswick was a leading 19th century scientific organization. Its publication output was impressive and it developed large specimen collections. Between 1862 and 1917 the society's *Bulletin* records 709 Society lectures and 105 public lectures. How did an amateur society, away from the major scientific centres, produce leading edge research? With no academic or

government institutions in Saint John the only science libraries belonged to the Natural History Society and the Mechanics' Institute. It is clear that the Society's intent was to provide members access to a first rate science library to support their research activities.

**Scott M. Campbell: "Jump Start: A Brief History of J. Wes Graham, Water Skiing and Microcomputers, 1979-1985"**

By the late 1970s, the University of Waterloo was world-famous for its educational computing program. J. Wes Graham had led these efforts for two decades, and in 1979 he saw an opportunity to combine two of his passions: computers and water skiing. The World Water Skiing Championships would be held in Toronto that summer and Graham developed a new computerized scoring and ski jump measurement system for the tournament. In my talk I will explore how Graham's explicitly non-academic side project can be linked with the educational philosophies he had pioneered at Waterloo, and how it coincided with the introduction and rapidly expanding use of microcomputers at the university and elsewhere.

**William W. Culver: "Missing Pages in the History of Copper Hydrometallurgy: Five Companies Formed Around an Innovative Technology in 1860s and 1870s"**

This paper looks at five companies formed to take advantage of what seemed a break-through innovation in processing lower grades of copper ores. Such a process seemed critical in the eyes of owners of four copper properties in the Appalachian Range and in Chile's coastal range. The process came out of the chemical mind of T. Sterry Hunt and was perfected by the practical experimentation of James Douglas - who as a result became an expert metallurgist. In the end flotation, not hydrometallurgy, was the breakthrough for commercial processing of the ore in these four mines. The paper questions why histories of copper metallurgy mostly ignore this phase (1860s and 1870s) of hydrometallurgical experimentation. There were a number of competing processes - similar in concept but different in their chemical approach. Major texts and the mining press all covered these earlier commercial applications of copper hydrometallurgy, but by 1915 they are all gone - almost as if they never happened.

At the same time in essays about James Douglas, especially in his obituaries, there are always respectful references to the Hunt & Douglas Process without specifics. It seems the writers politely avoid the issue that the process was never commercially successful on any wide basis - or they do not realize what it was all about. There were at least five major applications of the H & D process that can be documented in the 1870s: Harvey Hill (Quebec) over the life of two companies, Invernada (Tiltit, Chile) perhaps the first company formed anywhere for the sole purpose of using hydrometallurgy, Ore Knob (North Carolina), Chemical Copper (Philadelphia) which was a custom smelter, and in Colorado for copper-silver ore.

This work is part of a larger examination of technological innovation and politics in the world transition to reliance on low-grade copper ores.

**Ronald E. Doel and Suzanne Zeller: "National History, International Context: Collaborative Research on Circumpolar Science and Environment in the BOREAS Programme"**

The history of Canadian science and technology has much to gain from recent trends in collaborative research on an international scale. We offer as a case in point our own Collaborative Research Project,

entitled *Colony, Empire, and Environment [CEE]: A Comparative International History of 20th-c. Arctic Science*, one of 7 international projects funded under the BOREAS Programme established by the European Science Foundation, in partnership with both the Social Sciences and Humanities Research Council of Canada as well as the National Science Foundation in the United States. Launched in 2006 under the ESF's EUROCORES division to encourage European Collaborative Research, the BOREAS Programme shadowed the scientific research of the International Polar Year to focus humanities and social sciences research specifically on *Histories from the North*, in the form of *Environments, Movements, and Narratives*.

As the only historical Collaborative Research Project funded under the BOREAS programme, CEE highlights the history of science and technology in the circumpolar arctic through 9 separate projects by an international group of scholars. As the only Canadian member of CEE, Suzanne Zeller will discuss the place of her Canadian project within this larger circumpolar framework. More recently, the larger collaboration has moved toward secondary and even tertiary levels of integration, both within CEE as well as beyond it, including other CRPs even outside of the BOREAS Programme. We discuss the challenges, benefits, and larger policy implications of such higher levels of collaboration, with examples drawn from various BOREAS events held around the circumpolar arctic, including our most recent meeting in Iqaluit, Nunavut, the first ESF event ever funded outside of Europe.

#### Philip Enros: "Making the Case for Federal S&T"

This presentation provides an overview of the origins and activities of an ad hoc, interdepartmental committee of science assistant deputy ministers. The 'Science in Government' committee was formed in 1997 to make the case for federal S&T, in reaction to the Chrétien government's Program Review and months of negative media reports that summer about federal science. The history of the committee will be considered in the context of ongoing efforts in policy for science in the 1990s. It is part of a larger project on the history of policy for science in Environment Canada.

#### Célia Forget : « Inventorier numériquement l'immatériel : le projet IREPI »

L'IREPI, premier projet d'inventaire numérique multimédia à avoir été créé, fait la cueillette, la conservation, l'analyse, la valorisation et la diffusion du patrimoine immatériel du Québec, à l'aide de technologies audiovisuelles numériques. Le projet IREPI nous a permis d'acquiescer notre réputation sur la méthodologie d'enquête permettant « d'inventoriser » (inventorier et informatiser pour le web) les ressources du patrimoine immatériel. Son impact réside sans aucun doute dans l'accessibilité sur le web. Une base de données de plus de 550 fiches présentent des pratiques culturelles sur plusieurs supports (textuels, iconographiques et audiovisuels), consultables par mot clé ou par région géographique. Notre méthodologie d'inventaire se double d'actions culturelles qui favorisent la sensibilisation à l'importance du patrimoine immatériel et à la mise en valeur des richesses patrimoniales régionales. L'inventaire devient un outil de développement durable, les ressources identifiées contribuant au développement social et économique des régions. Nous avons développé des collaborations dans différents pays dont la France, la Belgique, Haïti, le Congo et l'Égypte, pour la réalisation de leurs inventaires nationaux.

#### Martin Fournier: « L'Encyclopédie du patrimoine culturel de l'Amérique française et les nouvelles tendances web : du 3D au *Serious gaming* »

L'Encyclopédie du patrimoine culturel de l'Amérique française est avant tout un projet de diffusion des

connaissances contemporaines sur le patrimoine, incluant les nouvelles manières de le concevoir, de l'étudier et de le communiquer. Soutenus par des articles de qualité scientifique, les documents multimédia permettent aux internautes de prendre contact avec un lieu, un bâtiment, une œuvre d'art, un savoir-faire, un rituel, un accent, une personne... L'Encyclopédie tire également profit de la numérisation 3D, grâce à des appareils de numérisation maintenant portatifs, qui permettent un contact inégalé avec les objets du patrimoine conservés dans les musées. Enfin, l'Encyclopédie offre un module destiné spécifiquement aux jeunes de 14-16 ans. Nous réalisons à leur intention une simulation de haut niveau (*serious gaming*) portant sur la démocratie, en tant que valeur et savoir-faire clés de notre société et sur les pratiques démocratiques actuelles et émergentes. Sur la base d'informations résumant l'évolution de la démocratie au Québec, son fonctionnement, ses institutions et son impact sur la société, ce module proposera aux participants de résoudre un problème de nature complexe par le biais des processus démocratiques. Les données statistiques sur les choix privilégiés par les participants à ce « jeu sérieux » deviendront progressivement le principal élément de la prise de décision démocratique qui permettra de résoudre le problème posé. Celle-ci évoluera donc au fur et à mesure que les participants s'additionneront. Les données de base de cette simulation reflèteront la diversité des enjeux, des acteurs et des opinions présents dans la société.

#### Delia Gavrus: "Envisioning Cyclopropane at the University of Toronto: From Scientific Production to Medical Technology, 1925-1940"

In the late 1920s, researchers working in the Department of Pharmacology at the University of Toronto described the anesthetic properties of a gas called cyclopropane. Several years later, the American anesthesiologist Ralph Waters transformed cyclopropane into a medical technology by introducing it into the hospital. My paper examines cyclopropane's transition between laboratory and operating room by focusing on the Toronto team's conceptualization of their discovery and their failure to incorporate the gas into clinical practice. I argue that for a number of reasons the Canadians did not envision cyclopropane as a useful medical technology. Social epistemologists have argued that, as Alan Gross put it, "discovery is not a historical event, but a retrospective social judgment." Subsequent scientific stories about the discovery of the anesthetic cyclopropane bear this out. Relying on archival material as well as published sources, I analyze the knowledge-productive practices that contributed to the construction of cyclopropane, but also the narratives of discovery that were eventually produced. I conclude that it is useful to make a distinction between cyclopropane the experimental laboratory gas and cyclopropane the medical anesthetic, despite the fact that scientific narratives of discovery do not. This case contributes to the understanding of the relationship between scientific production and medical technology.

#### Jean-Philippe Gendron : « Techniques chirurgicales et chirurgicalisation de l'obésité au Canada au 20<sup>e</sup> siècle »

De toutes les spécialités médicales, la chirurgie bariatrique, c'est-à-dire la réduction de l'obésité par des techniques chirurgicales, est celle qui connaît ces dernières années la croissance la plus marquée en Amérique du Nord. Notre présentation décrit l'histoire des facteurs qui supportent cette progression au 20<sup>e</sup> siècle, notamment la pathologisation de l'obésité et des critères de validation thérapeutique généralement exprimés en termes de rapport coûts / bénéfices. On verra que la lutte menée par les chirurgiens concernés pour faire reconnaître leur pratique repose d'abord sur le fait que, malgré des désaveux scientifiques et en l'absence de toute compréhension des processus étiologiques, la seule

efficacité technique n'en suffit pas moins à faire de l'obésité une « maladie chirurgicale » à la fin du 20<sup>e</sup> et au début du 21<sup>e</sup> siècle.

### Elizabeth Griffin: "Managing Historical Science: Creating a Resource Worth Having"

Legacies of scientific data from the past are as varied in number as they are in kind. Degrees of preservation are equally assorted in their feasibility, need and cost, the last two fighting it out in vigorous and often unfair competition. The most pressing re-use of such data is to measure change, be it in glacial retreats, domestic habits, celestial events, or the whole range of phenomena in between. Some elements of those data, such as descriptions or drawings of glaciers, simply need to be stored well and made accessible. Others (such as extant examples of old-world dwellings and folk practices) are best appreciated if brought together in one location (as in a museum). On the other hand, degradable materials like photographic records must be re-processed in a way that faithfully preserves their information content without jeopardizing its correct interpretation. In the latter respect, progress of a quality worthy of the effort will only result if guided by standards, made rigorously homogeneous, and pursued with a thoroughness that accepts the data warts and all. There is no need to defend their quality; the epoch of their creation makes historic observations unique and completely needed in a science that is based upon measurements of change.

### Elizabeth Griffin: "On the History of Women in Canadian Astronomy"

Astronomical research in Canada today has no internal frontiers. Participation is open to everyone who is adequately qualified, and our liberal culture actively encourages able minorities in race, gender, ethnicity, etc. to pursue science. Clearly it was not always thus, and a head-count of those who helped establish astronomy and astrophysics in Canada is woefully short of women. Yet even during the same early-20th century decades, women in astronomy south of the border were relatively numerous (though not without problems too). Comparisons with prominent women in science in other western nations suggest that the cause was almost entirely cultural, both through the restrictions which society enforced and through the inhibitions which institutions imposed. Moreover, the legacy of misogyny did not merely deprive research and teaching of a sizeable fraction of eligible brains; it also allowed the work which women *were* permitted to do to be thought of as second-rate, a concept which is still having unfortunate repercussions today.

### Dorotea Gucciardo: "Vibrators, Virility, and Voltage: Electric Medicine in Canada, 1860-1920"

Throughout the late nineteenth and early twentieth centuries, the technological potentiality of electricity in relation to health, beauty, and medicine captivated Canadians. Beauty gurus and quack physicians sold their goods and services to the general public, while groundbreaking medical innovations were established that have contributed to a better quality of life for most Canadians. One of the most popular forms of treatment introduced in the late 1880s was electrotherapy — where patients suffering from various ailments were “treated” with electric current — and it enjoyed groundbreaking success until the early decades of the twentieth century, when its application evolved from an administered treatment into various “home-use” kits that Canadians purchased and used on their own. Drawing from published reports, archival material, newspapers and magazines, I will trace the interaction between electrical technologies and culture and determine what values Canadians placed on

these technological remedies.

#### Vivien Hamilton: "Technology Without Science: Electro-therapeutics in Victorian Canada"

Historians of medicine have tended to assume that new technologies, such as x-ray tubes, functioned as symbols of the new scientific medicine that emerged in the last decades of the 19th century in Europe and North America. This paper complicates this picture by providing a case study in which doctors advertising electrical therapies involving the use of complex technology made no reference to the scientific basis of that technology. While contemporary electrotherapeutists emphasized the firm foundation provided by the physics of electricity, the Canadian doctors in this study did not stress the scientific basis of their treatment. Instead, doctors employed a number of alternate strategies to establish the efficacy and safety of electrical technologies.

#### Fathi Habashi: "The Beginnings of Metallurgical Research in Canada"

When Université Laval was created in 1852 it was composed of four faculties: Theology, Medicine, Law, and Arts. It was in this last faculty that the humanities and sciences were taught. Engineering was not considered at that time as a subject suitable for being taught in a university whose main mission was to advance the faith. The first teacher of chemistry, mineralogy, and elements of metallurgy in the Faculty of Arts was the American chemist-mineralogist Thomas Sterry Hunt (1826–1892), a graduate of Yale University who first joined the newly founded Geological Survey of Canada in Montreal. He was hired by Laval University in 1856. However, in 1862 he joined the newly founded Morrin College in Quebec City to teach chemistry which was affiliated with McGill University in Montreal. Morrin College was founded on the initiative of Scotsman, Dr. Joseph Morrin, former mayor and prominent Quebec City doctor. It was during this period that Sterry Hunt developed a hydrometallurgical process for the treatment of a copper oxide ore deposit in the Quebec region belonging to the James Douglas family.

At the same time, pyrometallurgical research was started at McGill University when Alfred Stansfield (1872-1944) came from the Royal School of Mines in London as the first professor of metallurgy. Other metallurgical research undertaken during this epoch was at Queen's University in Kingston by Canadian-born William L. Goodwin (1856-1941) and William Nicol, both of whom studied in Germany. Since then, extractive metallurgical research flourished and Canada became a world leader in this field.

#### Ruby Heap: "The Making of the 'Problem' of Women in Science and Engineering in Canada: The Emergence of the Issue in the 1970s and 1980s"

The unequal participation of women in science and engineering has been discussed and debated for more than three decades in Canada as well in the United States and Western Europe. The persistence of gender differentials in S&E has become a key element of what researchers and activists continue to define today as the "problem" of women in S&E. The time has come to go back to the past, so that we can place this problem in its historical context and develop a general interpretative framework with which to map its distinct phases and various manifestations over time. Two key questions need to be addressed: when, why and how did the issue of women's under-representation in S&E emerge as a distinct object of public policy in Canada, and how has this issue been shaped and reshaped as a "gendered" problem requiring specific types of policies and interventions? This paper will consider the first question by focusing on the emergence of the issue in the 1970s and 1980s. It will discuss how this



issue was conceptualized as a “problem,” locate the main groups and actors involved in this process and how the latter were instrumental in placing women’s concerns onto the Canadian science and technology agenda. A comparison will be made with the United States, where similar developments can be observed during this period. This paper is part of a new project that will examine the making of the “problem” of women in S&E in English-Canada and Francophone Quebec between 1970 and 2006. Its main objective is to demonstrate the importance of incorporating a gender analysis into the study of S&T policy.

#### Jennifer Hubbard: “Breaching the Silos of Science: Transference of Concepts from Forestry to Fisheries Science”

In fisheries biology the management goal of Maximum Sustainable Yield emerged around World War II, when fisheries biologists used population studies to develop fishing equations for predicting stock abundance. The first iteration of the concept of MSY in fisheries came from Norway’s pioneering fisheries biologist Johan Hjort. Hjort introduced this field to Canada during the Canadian Fisheries Expedition 1914-15. Later, during the Great Depression, he introduced the theory of “optimal yield,” reorienting the thinking of fisheries biologists. But the terms “optimal yield” and “sustained yield” are much older, found in American forestry and before this in German scientific forestry. This paper explores the implications the transfer of this 19<sup>th</sup> century normative understanding to other resource sciences through the Progressive Era’s focus on the “rational use” conservation of resources. While similar goals and terminologies emerged in forestry and fisheries science, fisheries literature does not acknowledge any influence from forestry science, so such transfers can be argued only circumstantially. Evidence is bolstered by the University of Toronto’s role as a nexus both for introducing German scientific forestry into Canada by Bernhard Fernow (who also pioneered scientific forest management in the United States) exactly when the new science of fisheries biology was being fostered there by its first Canadian practitioners, notably Archibald Gowanlock Huntsman. The evidence that Huntsman “borrowed” ideas from forestry science—without, however, acknowledging this source—hints at the wider use of forestry management concepts in managing limited environmental resources.

#### Michelle Hoffman: “Constructing School Science: Physics, Biology, and Chemistry Education in Quebec and Ontario Secondary Schools, 1884 - 1965”

In Ontario, science had achieved a secure place on the high school curriculum by 1880. Debate focused no longer on whether science warranted time on the curriculum, but rather on which scientific subjects were most valuable. As the Province’s universities began to promote individual laboratory work, the Department of Education stressed, in turn, that high school science be taken up practically and experimentally. This paper argues that the particular confluence of factors shaping science teaching in Ontario – namely, the long reach of the Department of Education and its control over local school governance; the well-entrenched academic tradition of the high schools; and the influence of a small coterie of vocal science masters – led to a series of narrowly defined pedagogical goals for high school science teaching that remained resistant to reform until the mid-1960s.

#### Richard A. Jarrell: “Justin de Courtenay and Commercial Wine-making in Canada”

This paper is a study of de Courtenay’s claims about growing vines in Canada and making wine commercially in the 1860s. He made several failed attempts to obtain subventions from the provincial government (Canada and Ontario) but did operate a commercial winery in Cooksville, Ont., with some



success. In the end, the venture failed. As an aggressive apostle of wine-making, he was a century ahead of his time but his viticultural views, dismissed by his contemporaries, were partly vindicated in the 20th century.

**Steve Koerner: "Nationalism and Technology: The 'All-Canadian Car,' 1960-1978"**

In 1960 the Canadian automobile industry, mainly composed of foreign-owned branch plant operations, was in crisis. Production had dropped because of increased imports. Some blamed this production crisis on the branch plants for building cars that failed to meet the needs of Canadian consumers. The answer was an "All-Canadian Car," one entirely designed and manufactured for Canadians by Canadians. Although an "All-Canadian Car" never did appear, the fact the idea emerged and generated public debate raises questions about nationalism and technology.

**James Lambert : « Les lieux de la mémoire scientifique à l'Université Laval : un aperçu »**

Cette présentation fournira un aperçu du patrimoine généré par l'enseignement et la recherche en sciences à l'Université Laval depuis 1852. Elle mettra la constitution de ce patrimoine dans le contexte de l'évolution de l'idée d'université à Québec, surtout depuis l'introduction de la modernité au Québec du 20e siècle. Fait partie de cette évolution la mise en place de lieux de mémoire, dont les livres rares scientifiques de la Bibliothèque, la collection géologique, les Collections de l'Université et la Division des archives, comprenant archives scientifiques et archives de folklore portant sur le patrimoine scientifique populaire.

**Sylvie Laneuville : « Le patrimoine d'Hydro-Québec, une histoire d'innovations technologiques : le cas du compteur électrique »**

Dans la seconde moitié du 19e siècle, l'avènement de l'électricité, une découverte scientifique prometteuse, soulève bientôt des préoccupations pratiques chez les premières compagnies d'électricité : comment facturer correctement la consommation d'électricité du client ? Cette question débouche sur la mise au point d'un appareil de mesure mécanique, le compteur, qui deviendra le « trait d'union » entre les compagnies d'électricité et les consommateurs pendant plus d'un siècle. À travers plusieurs générations de compteurs (1888-2008), se dessine l'histoire des innovations technologiques ayant contribué à l'efficacité de cette interface technologique et des changements apportés aux méthodes de travail des employés d'Hydro-Québec.

**Bertrum H. MacDonald, Peter G. Wells, Ruth E. Cordes, Danielle M. Cossarini, and Julie L. Woods: "Reading Environmental Literature: Findings from Studies of the Publications of Two Governmental Organizations"**

Environmental issues have gripped international attention recently, although environmental concerns have been building for decades. Over the past half century, thousands of reports about environmental conditions have been published. Governmental organizations, in particular, have produced vast quantities of documents. The fate of many such publications, from the perspective of readership, has been little studied. As one window on readership of environmental reports, we have studied the publications of two governmental organizations: the Gulf of Maine Council on the Marine Environment and Environment Canada. Both have produced a large and diverse body of publications in print and digital formats. Our paper will give a perspective of publishing, readership, and use of

environmental literature at the end of the twentieth century.

**Larry McNally: "Canadian Millwrights: Who They Were and Their Role"**

This paper will examine early millwrights in Canada, where they came from, how they functioned and what type of mills they built. A number of important millwrights will be discussed. A large portion of the paper will be on how the millwrighting trade started to specialize after 1850. Technological changes such as the advent of turbines, factory-made milling components, and the development of much larger commercial mills fragmented the profession. There will be comments on the difficulties of studying millwrights, both as individuals and as a group.

**Jenna Murdock Smith: "A Prescription for Pure Milk, Sunshine and Fresh Air: The Ontario Provincial Board of Health and the Exhibition of Tuberculosis, 1911-1929"**

This essay examines the Ontario Provincial Board of Health and its efforts to educate the public on disease and health through visual display. Beginning in 1911, this government body put on an annual public health exhibit at the Canadian National Exhibition in Toronto. Drawing on the work of Keith Walden and Tony Bennett, I argue that the exhibition was used as a tool of discipline and surveillance; a site designed to encourage the public on how to regulate their bodies and domestic spaces. At the exhibit science and medicine were hailed as examples of modernity and progress. Much of its success rested on the public trusting in the advice put on display, which led the Board to rely on various techniques to convey medical authority. This was accomplished by displaying technologies, such as the X-ray, which were quite novel to audiences in the early twentieth century. Following the exhibits through the Board's annual reports, photographs taken of the displays, and media coverage, this paper reveals a tension between the scientific, regulatory intent that organizers had for the exhibits and the frivolous, often spectacular elements of the displays that audiences responded to.

**David Orenstein: "Kepler in Quebec: Resources for the History of Astronomy From the Séminaire de Québec"**

The astronomical books, manuscripts, and instruments in the Archives of the Musée de la civilisation in Quebec City come from the Séminaire de Québec, established in 1663. The Séminaire also inherited the collection of the Collège des Jésuites, closed by British forces in 1759. This paper surveys such collection highlights as a 1665 manuscript of a *Physica* course delivered at the Collège, Jean Talon's personal copy of Kepler's *Rudolphine Tables* or a detailed manuscript observation of a 1780 solar eclipse by one of the Séminaire's teaching fathers.

**David Pantalony: "Nuclear Medicine in Canada in the 1950s: History through One Artifact"**

The Theratron Junior, a sleek green radiation therapy machine made and sold by Atomic Energy of Canada Ltd, is a powerful symbol of Canadian science, technology, and medicine in the late 1950s. It used Cobalt 60, a by-product of Canada's pioneering NRX nuclear reactor at Chalk River, for treating cancer patients. It represented developments at the University of Saskatchewan, AECL, and the National Research Council to apply nuclear materials and technologies towards medical ends. An actual example of the machine now at the Canada Science and Technology Museum adds important dimensions to this history. It carries stories of technical innovations, manufacturing, design, marketing, and international sales. In this paper, I shall present a biography of this artifact from several angles as a

novel means for exploring Canadian history during the early atomic era.

**Sébastien Piché : « Entre l'université, les besoins technologiques de l'industrie et le développement éducatif des collèges : quelle est la contribution des établissements du réseau collégial québécois à la recherche scientifique et technologique ? »**

Les établissements du réseau collégial québécois bénéficient de programmes de subventions à la recherche depuis 1972 et ont une mission de recherche depuis 1980. La mesure de l'activité scientifique de leurs chercheurs démontre une forte progression entre 1982 et 1992, mais un déclin à partir de 1995. Coïncés entre le modèle de la recherche universitaire, la volonté d'exploiter la situation sociale et géographique des cégeps pour le développement technologique, la priorisation du développement éducatif par les collèges eux-mêmes et la fragilité du soutien à la recherche, les chercheurs de collège demeurent un groupe social dont l'identité n'est pas clairement définie.

**Louise St-Pierre : « Le patrimoine immatériel religieux du Québec : sauvegarder l'immatériel par le virtuel »**

Le patrimoine religieux au Québec est menacé par les conséquences de la laïcisation de la société : déclin des pratiques religieuses, fermeture des églises, fusion des paroisses, désacralisation des objets du culte. Reconnaissant l'importance du patrimoine religieux dans la compréhension de la société québécoise contemporaine, les communautés religieuses, les gouvernements et les citoyens ont pris en main la sauvegarde des patrimoines mobilier et immobilier. Mais assurer la conservation du matériel sans se préoccuper de l'immatériel ne fait plus sens aujourd'hui. Ce sont les composantes immatérielles (la mémoire, les valeurs, l'attachement) qui insufflent un sens à la culture matérielle. Au cours des dernières années, la Chaire de recherche en patrimoine ethnologique de l'Université Laval a développé une méthodologie d'inventaire multimédia permettant de combiner le matériel et l'immatériel en se préoccupant par exemple des récits de pratiques entourant un objet ou un lieu de culte. Plus qu'un simple inventaire destiné à la conservation, la base de données multimédia virtuelle développée par la Chaire facilite la communication du patrimoine immatériel religieux offrant ainsi un moyen de le conserver et de l'actualiser et le valoriser. La Chaire collabore avec la Direction du patrimoine et de la muséologie du ministère de la Culture, des Communications et de la Condition féminine du Québec (MCCF) afin d'intégrer sa base de données sur le patrimoine religieux immatériel à la banque de données ministérielle qui recèle déjà une grande quantité d'informations sur le patrimoine immobilier (bâtiments et sites) et mobilier (meubles, oeuvres d'art, vêtements, artefacts) religieux.

**Stéphanie Tésio : « Expansion coloniale, savoirs botaniques et pharmaceutiques au Canada au XVIIIème siècle : les travaux de Michel Sarrazin (1659-1734) et de Jean-François Gaultier (1708-1756) »**

En Europe, dans ses colonies, l'Académie royale des Sciences de Paris met en place un réseau *via* ses académiciens qui entretiennent des relations épistolaires avec des savants disséminés un peu partout dans le monde. Ce qui est le cas des deux médecins du roi Michel Sarrazin et Jean-François Gaultier. À partir des 4 manuscrits qui leur sont attribués, le projet de post-doctorat propose un rassemblement des données concernant l'environnement botanique et pharmaceutique, du Canada au XVIIIème siècle, une mise en valeur de leur rôle.

**David Theodore: "The Fattest Possible Nurses': Computers and the Hospital from the Nuffield Foundation to Cybernetic Serendipity"**

I propose to examine the rise of computer-aided design by tracing the way cybernetic processes were tested and publicized through hospital architecture. Architects used computers to organize flexible buildings simultaneously capable of optimizing staff workflows and anticipating future change. What are the links between bioinformatics and computer-aided hospital design? Through an examination of institutional publications, trade journals, photographs, and diagrams, I will trace some of the proposals and strategies pursued by Richard Llewelyn-Davies and his associate John Weeks from their initial work for the Nuffield Foundation to the celebrated traveling exhibition Cybernetic Serendipity, which featured one of their projects.

**Marie-Claude Thifault : « Technique et spiritualité en nursing psychiatrique à l'hôpital Saint-Jean-de-Dieu, 1912-1964 »**

Créée en 1912, l'école de gardes-malades l'hôpital psychiatrique Saint-Jean-de-Dieu participe à la transformation de l'asile en un véritable hôpital. Ses archives permettent une analyse du discours de l'élite infirmière, basé sur l'importance des découvertes scientifiques et des nouvelles techniques. De fait, les étudiantes sont initiées aux techniques psychothérapeutiques, médicamenteuses, de choc (électroplexie et cure d'insuline), occupationnelles ainsi qu'aux cures de sommeil. Cela dit, l'École d'infirmières, reconnue pour son expertise scientifique, propose aussi une formation axée sur la transmission de valeurs spirituelles. Par ce biais, il sera intéressant de mettre en perspective les côtés spirituel et technique dans l'approche thérapeutique en vigueur à l'Hôpital Saint-Jean-de-Dieu de 1912 à 1964.

**Robert Tremblay : « Vicissitudes Du Métier de Forgeron au Canada à l'ère de la Révolution de la vapeur, 1815-1880 »**

Le présent exposé tente de retracer l'itinéraire professionnel d'un groupe social relativement restreint, les forgerons des grands centres urbains, entre 1815 et 1880, au moment où les premiers signes de l'industrialisation commençaient à gagner le secteur de la transformation des métaux au Canada. Nous nous sommes demandés, entre autres choses, comment les forgerons s'étaient adaptés à ce changement sociotechnique qui menaçait non seulement leurs traditions, leur savoir-faire et leurs valeurs, mais aussi leur statut d'artisan. Chemin faisant, nous nous sommes aperçus que ceux-ci avaient profité du caractère imparfait des nouvelles technologies, pour préserver leur métier, leur autonomie professionnelle et leur éthique d'artisan au sein de la grande entreprise industrielle. Avec l'arrivée des premières entreprises de construction mécanique dans les années 1850, on vit toutefois apparaître une volonté d'affermissement du pouvoir de gestion patronal à l'égard du travail. Les forgerons n'eurent alors d'autres choix que de s'allier à de nouveaux corps de métier (notamment les ingénieurs et les machinistes) afin de préserver leurs prérogatives, et ce, au prix parfois de durs conflits sociaux avec leurs employeurs. Je rappelle que cette présentation s'inspire de plusieurs éléments d'un livre à paraître prochainement sur le métier de forgeron, écrit en collaboration avec Thiery Ruddle.

**Sean Tudor: "Through the Lens of the Mackenzie Valley Pipeline Project: Society, Technology, and the Environment"**

The Mackenzie Valley Pipeline project was defined by its social, technological, and environmental issues. This paper examines two arctic grade pipes designed for the Alaskan Highway Pipeline project to illustrate how pipeline technology was adapted to cold weather climates. It then looks at the use of pipeline technology to mitigate environmental concerns. Finally the paper discusses the social and environmental issues voiced by First Nations in the 1970s versus the opinions of these same communities now that the Berger Inquiry moratorium expired. It concludes with the analysis of the shift in the environmental debate regarding resource extraction in the North.

Laurier Turgeon et François Côté : « Explorations, approches, méthodologies et outils: présentation de la Chaire de recherche du Canada en patrimoine ethnologique et du Laboratoire d'enquête et d'entrevue multimédia de l'Université Laval »

Internet a multiplié les possibilités de penser, pratiquer, communiquer et valoriser le patrimoine. Avec, d'une part, les « campagnes » de mise en ligne de millions de documents textuels, visuels, sonores et audiovisuels et, d'autre part, la possibilité de diffuser des informations multimédias sur des monuments, des sites, des événements, des pratiques, des savoir-faire du patrimoine, les possibilités récentes transforment notre rapport au patrimoine, en le rendant plus accessible sur ses formes multiples et en faisant participer plus activement ses détenteurs à sa mise en valeur. C'est dans ce contexte que la Chaire de recherche du Canada en patrimoine ethnologique explore des avenues d'avant-garde, en s'intéressant à la fois à des objets de recherche originaux (notamment le patrimoine culturel immatériel) et à des méthodes à la fine pointe de la technologie numérique Web (banques de données multimédia, *serious gaming*, numérisation 3D, etc.). Notre groupe s'est imposé, au cours des cinq dernières années, comme un chef de file au Canada et sur le plan international dans l'inventorisation multimédia du patrimoine culturel immatériel. En effet, nous avons développé des collaborations avec l'UNESCO, la Belgique, la France, la Suisse, la Chine, le Congo et Haïti. La sauvegarde d'informations ethnologiques, réalisée encore récemment sur supports analogiques (bandes magnétiques et films), exigeait autrefois des équipements lourds, de longs séjours sur le terrain, des conditions de conservation particulières (salles à température et à humidité contrôlées) et des coûts élevés. Nous avons transformé ces modes de recherche. Nos équipements numériques et technologies Web nous ont permis d'innover en renouvelant les méthodes d'enregistrement, de conservation, de diffusion et de valorisation du patrimoine immatériel. Plus encore, c'est notre approche intégrée de ces différentes technologies qui nous a permis de mettre en valeur le patrimoine ethnologique de manière dynamique et vivante.

Peter G. Wells: "A History of Research in Environmental Science and Ecotoxicology at SABS (St. Andrew's Biological Station)"

Environmental science has been conducted at the St. Andrews Biological Station (SABS or the Biostation) since it was established in 1908. This paper briefly describes early work up to the 1950s, especially studies on DDT and Atlantic salmon; the extensive aquatic toxicology studies in the program formally established between late 1950 and 1970; and the many contributions to environmental chemistry, aquatic toxicology, and ecotoxicology since the 1970s, in the Environmental Science Program. The Biostation's staff and associated researchers have contributed to marine environmental science and ecotoxicology in Canada for decades, gaining national and international recognition for their many studies on Maritime Canada's aquatic ecosystems.

**Andrew H. Wilson: "Issues in Government-related Science: The Economic Council and Science; the Science Council and Economics"**

Founded in 1963 and 1965, respectively, these two Councils were parts of the apparatus established by the federal government of the day to garner specialist policy advice in two areas of national importance. Over the years, both did deliver as required. But the advice was sometimes tempered by inputs from other areas: science and technology in the case of the Economic Council, and economics in the case of the Science Council. This paper discusses the "rogue" studies by both Councils in their earlier years of operation - years on both sides of 1970. It concludes that neither Council was wholly successful in persuading the government to accept its subsequent advice based on these studies.

**Andrew H. Wilson: "The Diefenbunker"**

Built between 1959 and 1961 at Carp, a dozen miles outside Ottawa, this most unusual four-storey underground structure was initially intended to be the refuge of the Government of Canada in the event of a nuclear war. Thankfully, this war never came to pass and the bunker was used as a military and communications base with 24-hour readiness until it was decommissioned in 1994, the same year it was designated as a National Historic Site. In 1998, the building was "resurrected" as a museum, with partial restoration of its original equipment, and dedicated to the preservation of Canadian Cold War memorabilia.

**Diane C. Zerr and Bertrum H. MacDonald: "Nineteenth-Century Canadian Naturalists and Communication Networks"**

In the latter half of the nineteenth century increasing attention was placed on developing networks of contacts. Communication networks were important for exchanging and identifying specimens, building collections, making discoveries known, and keeping natural history interests active. Widely dispersed Canadian naturalists relied on correspondence to meet their communication needs. To foster this communication, directories of naturalists were introduced. One such directory, *The Naturalists' Directory*, edited by Samuel E. Cassino in Salem, Massachusetts, included hundreds of Canadians among many more American names. In this paper, we discuss the Canadian naturalists listed in the 1884 and 1886 editions of *The Naturalists' Directory* and present a profile of Canadian naturalists in the 1880s.

## **Sponsors / Commanditaires**

L'Institut du patrimoine culturel/Institute for Cultural Heritage, Université Laval  
<[www.ipac.ulaval.ca/](http://www.ipac.ulaval.ca/)>

Les Laboratoires d'archéologie de l'Université Laval <[www.laboarcheologie.ulaval.ca/](http://www.laboarcheologie.ulaval.ca/)>

Musée des sciences et de la technologie au Canada / Canada Science and Technology Museum  
<[www.sciencetech.technomuses.ca/](http://www.sciencetech.technomuses.ca/)>

Royal Society of Canada / La Société royale du Canada <<http://www.rsc.ca/>>

School of Information Management, Dalhousie University <[sim.management.dal.ca](http://sim.management.dal.ca/)>

## **Acknowledgements / Remerciements**

Translations / Traductions : Annie St. Jacques, Université Laval, Québec

Program Design & Layout / Conception et mise en page du programme : Danielle Cossarini,  
Dalhousie University, Halifax

Printing / Imprimeur : ETC Press Limited, Halifax

Image courtesy of / L'image est une gracieuseté de : Musée des sciences et de la technologie au  
Canada / Canada Science and Technology Museum, Ottawa – Octant, ca. / vers 1790.

