Journal of Eastern Townships Studies

Revue d'études des Cantons-de-l'Est

Bishop's University Research Clusters

Eastern Townships Resource Centre / Centre de ressources pour l'étude des Cantons-de-l'Est

Journal of Eastern Townships Studies

Revue d'études des Cantons-de-l'Est

No 37
Fall / Automne 2011

ACKNOWLEDGMENTS / REMERCIEMENTS

For this issue the editor acknowledges the financial assistance of:

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Pour ce numéro la rédactrice tient à remercier de leur généreux soutien financier :

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La *Revue d'études des Cantons-de-l'Est (RÉCE)* est une revue scientifique publiée par le Centre de ressources pour l'étude des Cantons-de-l'Est. Les articles parus dans la *RÉCE* sont répertoriés dans l'*Index des périodiques canadiens, Canadian Index* et *CBCA*. La revue peut être consultée dans la base de données *CBCA Fulltext* de Micromedia et dans celle de l'*Index des périodiques canadiens* de la Information Access Company. Nous invitons les chercheurs et chercheuses de toutes les disciplines des sciences et sciences humaines à nous soumettre des articles portant sur les Cantons-de-l'Est. Nous acceptons des textes de 2 000 à 7 000 mots, saisis sur traitement de texte à double interligne, et présentés selon les normes de publication de la discipline de spécialisation. La *RÉCE* peut accepter des articles plus volumineux avec l'approbation de la directrice de la revue. Les articles et les bilans doivent être accompagnés d'un résumé d'une centaine de mots en français et en anglais. Veuillez faire parvenir vos articles à l'adresse courriel suivante : *ccharpen@ubishops.ca*.

Cover photograph/*Photographie de la couverture* : Dale Stout

Design : VisImage

Printing/*Impression* : Imprimeries Transcontinental, division Métrolitho

Legal deposit / *Dépôt légal* : 4th quarter, 2011 / *4 e trimestre 2011*

NO 37
2011

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Editor's Note

The beauty of the Eastern Townships region is particularly striking in the fall when trees display their splash of colourful foliage. Earthy smells permeate the air. Shivery autumnal leaves laced with the touch of frost foreshadow the sting of wintry days to come. Edged in beautiful purple, Bishop's University's signature colour, our cover photograph and its underline communicate both the nearness of winter and the thematics of this special issue.

In 2009, four research clusters were selected to implement Bishop's University's Strategic Research Plan. These interdepartmental research units are named the STellar Astrophysics and Relativity (STAR) cluster, the Multi-Scale Climate and Environmental Change (MUSCLE) cluster, the Crossing Borders cluster, and the Psychological Health and Well-being (PHWB) cluster. With a view to conveying the vibrancy of the research culture practised within the University's premises, we have produced a special issue on this theme. As such, we have invited four leading Bishop's University researchers, each linked to one of the clusters, to introduce their cluster's objectives, broad goals, important areas of research and specialized axes, while articulating its relevance to the community at large. Two of these, Cristian Berco and Fuschia Sirois, hold a Tier II Canada Research Chair and coordinate the Crossing Borders and PHWB clusters respectively. This issue of *JETS* also includes two scientific articles authored by Bishop's researchers Elisabeth Levac and Estelle Chamoux. They illustrate the kind of research carried out within the MUSCLE and PHWB clusters.

Also featured within the covers of *JETS 37* are two non-thematic articles. Jacques Gagnon's article traces the family lineage among Members of Parliament of the Eastern Townships region for the 1829–2008 period and draws the socioeconomic and political profiles of the deputies under study. Silvie Bernier's interesting paper discusses the heritage value of two residential buildings located in Sherbrooke's Old North while highlighting the influence of Anglo-Saxon and American architectural trends on the architecture of the Eastern Townships. The publication also includes an archival section, made up of two articles. Readers with an interest in toponymy will enjoy reading Jean-Marie Dubois and Gérard Coté's article identifying those elected officials (mayors, secretary-treasurers, officers, councillors) linked to the Township of Ascot and municipalities of the Townships of Ascot and Westbury within the 1841–2001 period, whose names have been retained in the Sherbrooke toponymy. Chlöe Southam's article offers an opportunity to learn about the important role played over the past century by three Eastern Townships-based women's groups that have contributed to the well-being of their communities. Finally, Jean-Pierre Kesteman's lively book review of Guy Laperrière's *Les Cantons-de-l'Est* will undoubtedly incite all Townships history buffs to dash up the stairs of the nearest bookstore in search of this insightful and informative work on regional history.

On behalf of the Editorial Committee, it is my pleasure to offer you this splendid issue impregnated with the dye of Bishop's University's vibrant research tradition. Enjoy the read if not the hint of frosty wintertime!

—Claude Charpentier

STellar Astrophysics and Relativity at Bishop's University*

Lorne Nelson
Bishop's University

Abstract
Bishop's University has recently adopted a Strategic Research Plan that should greatly enhance the overall research effort. Specifically, the university invited proposals from various research groups from all disciplines to create well-defined research clusters. In 2009, the university selected four of these clusters based on their potential for research excellence. The STAR cluster (STellar Astrophysics & Relativity) was one of the clusters selected. The cluster is a natural extension of the work and accomplishments that had already been achieved in the area of astrophysics at Bishop's over the past two decades. This paper first provides some context and background for those unfamiliar with astronomy and astrophysics, and then describes the history leading to the formation of the cluster formed and outlines the goals it expects to achieve. Finally, the objectives of the cluster with respect to science outreach and how it directly affects the various communities within the Eastern Townships is discussed.

Résumé
L'Université Bishop's a récemment adopté un plan stratégique pour la recherche qui devrait globalement améliorer ses efforts de recherche. Plus précisément, l'université a invité différents groupes de chercheurs de toutes les disciplines à proposer la création de grappes de recherche bien définies. Quatre grappes furent sélectionnées en 2009 en se basant sur le potentiel d'excellence de leur recherche. C'est ainsi que la grappe STAR (un acronyme de STellar Astrophysics & Relativity) fut créée. Cette grappe est un prolongement naturel des travaux et des réalisations entrepris dans le domaine de l'astrophysique à Bishop's au cours des deux dernières décénnies. Cet article présente le contexte scientifique et propose de l'information de base pour les lecteurs non-initiés à l'astronomie et l'astrophysique; il passe en revue l'histoire menant à la formation de la grappe et résume les objectifs de recherche attendus. En dernier lieu, l'article discute des objectifs de vulgarisation scientifique et de leurs impacts sur les différentes communautés des Cantons-de-l'Est.

Who hasn't peered into the night sky and marveled at the immensity of the universe or been awestruck by the number of stars residing in it? Throughout the millennia, the celestial firmament has inspired poets to write epic odes to the beauty of the heavens and has motivated philosophers to explore new lines of reasoning. In one of the greatest pieces of American literature, *The Adventures of Huckleberry Finn*, Mark Twain penned the famous passage:

> … we had the sky, up there, all speckled with stars, and we used to lay on our backs and look up at them, and discuss about whether they was made, or only just happened …[1]

When this text was written more than a century ago, the answer to these questions was not at all known. It was thanks to the advancement of research in fundamental science that we now have definitive answers. However, in answering these questions, scientists have formulated a host of new and extremely challenging questions for which there is not yet an answer. These problems include the following: (1) What happened at the time of the Big Bang? Were many parallel universes spawned simultaneously? (2) What is the reason for the existence of the so-called Dark Energy that supposedly drives the expansion of the universe? (3) Most of the mass in the universe has not been detected (i.e., the dark matter). What is it and can we detect it? If history is any guide, we expect that the answers to these problems will have significant and very tangible benefits for humanity.

Bishop's University certainly recognizes the importance of fundamental research in the sciences and for that reason it has chosen the STAR cluster as one of the four primary clusters of research excellence (Figure 1). STAR is an acronym for STellar Astrophysics & Relativity and the cluster comprises five members from the faculty complement at Bishop's in addition to several graduate (and undergraduate) student researchers. The STAR cluster is truly interdisciplinary and brings together astronomers, physicists and mathematicians working in the areas of cosmology, astronomy, astrophysics, and gravitation. These disciplines are an important component of what was originally viewed as a liberal-arts education. Finding

Fig. 1: The logo of the STAR cluster.

its rudiments in the writings of Plato,[2] a university-level liberal arts education was composed of two separate groupings of subjects. The trivium comprised the subjects of grammar, rhetoric, and logic, while the quadrivium consisted of arithmetic, geometry, astronomy, and music. These seven subjects constituted the liberal arts and were considered as the basis for subsequent study of (natural) philosophy and theology. As such, the research work performed by the members of the STAR cluster dovetails nicely with the clearly defined liberal-arts mission of Bishop's University.

The Ascendance of Physical Science

The era of modern science can be traced back to the 17th century and received its greatest impetus from scientists such as Galileo and Newton. They concluded that mathematics was the language of the universe and that all of natural phenomena could be understood within a precise mathematical framework. Thus their view of the world was a very mechanistic (i.e., deterministic) one; they believed that a set of immutable Laws of Nature could be derived. We now regard this notion as somewhat naive but it would be fair to say that unlike their predecessors (notably Copernicus and Kepler who obtained many of the prerequisite observations on which Galileo's and Newton's work was based), they recognized how to exploit the power of mathematics to explain natural phenomena in a precise and logical manner. One of the great successes of Newton was that he was able to unite what was considered at the time to be two separate branches of physics, namely astronomical mechanics (e.g., the orbits of the planets) and terrestrial mechanics (e.g., the acceleration of a mass attached to a spring). With one set of mathematical equations he was able to explain the results obtained for both types of observations. Thus astronomy and physics became truly unified. Moreover, his mathematical equations had tremendous predictive power. It was the overall correctness of these predictions that gave scientists of the time enormous confidence in their validity.

The desire for this type of unification has continued over the centuries and physicists are now seeking the holy grail of nature: a single unified theory or TOE (theory of everything!). So why do physicists think that everything can be explained within one unified mathematical framework? Consider the following: two hundred years ago it was thought that electricity and magnetism were two very distinct and separate phenomena. Thanks to the brilliance of Maxwell in the middle the 19th century, he was able to use the power of mathematics to show that electricity and magnetism were manifestations of the same physical phenomenon (which we now refer to as electromagnetism).[3] Out of these seemingly esoteric equations came a fundamental understanding of optics that allowed us to understand how we could generate electromagnetic waves. This discovery enabled the first radio pioneers such as Reginald Fessenden[4] (a former resident of the Eastern Townships) to make their transmissions which then led to the subsequent invention of the television, cellular phones and other forms of communication that are so essential to our enjoyment of everyday life.

Hidden in Maxwell's equations are the elements of the theory of Special Relativity. This was the first of Einstein's famous contributions to physics that led to some amazing conclusions. In particular it asserted that moving objects age more slowly (time dilation) than objects at rest and that energy and mass can be viewed as being closely related (i.e., the famous equation $E=mc^2$). This latter conclusion allows us to calculate how much energy is produced by nuclear fusion in the sun[5] (i.e., the conversion of four hydrogen nuclei into a helium nucleus). Furthermore, these results are at the heart of our understanding of how much energy is produced via nuclear fission.

In 1915, ten years after his theory of Special Relativity, Einstein devised a truly brilliant theory of gravitation that built upon Newton's gravitational theory by viewing gravity as geometry (e.g., the bending of space-time). According to this theory, known as General Relativity, gravity acts to alter the path of a photon (i.e., light) by forcing it to move along a particular geodesic. This theory has enjoyed some spectacular successes. Every prediction that it has made has been validated by experiments over the past century. For example, the bending of light has been observed and we now know that the so-called dark matter in the universe can actually act as a lens that is capable of creating multiple images of a single source of light. But its most spectacular success has been the prediction that the universe is expanding. If we observe distant galaxies in the universe, we see that all of them are moving away from us. We say that their light is redshifted; in other words, due to the Doppler effect, the wavelength of the light emitted by the stars in those galaxies is shifted to the red end of the spectrum (i.e., longer wavelengths). This is somewhat analogous to the Doppler shift of the sound that we hear from sirens on fire engines as those vehicles move away from us. The frequency of the sound clearly decreases with a concomitant increase in the wavelength. Just because everything is moving away from us does not imply that we are located at the centre of the universe. Perhaps a good paradigm for the expansion of the universe would be to consider the rising of a loaf of raisin bread as it bakes (Figure 2). When the dough is uncooked, the raisins within it are relatively close to each other. We can imagine that each one of those raisins represents a cluster of galaxies and that we

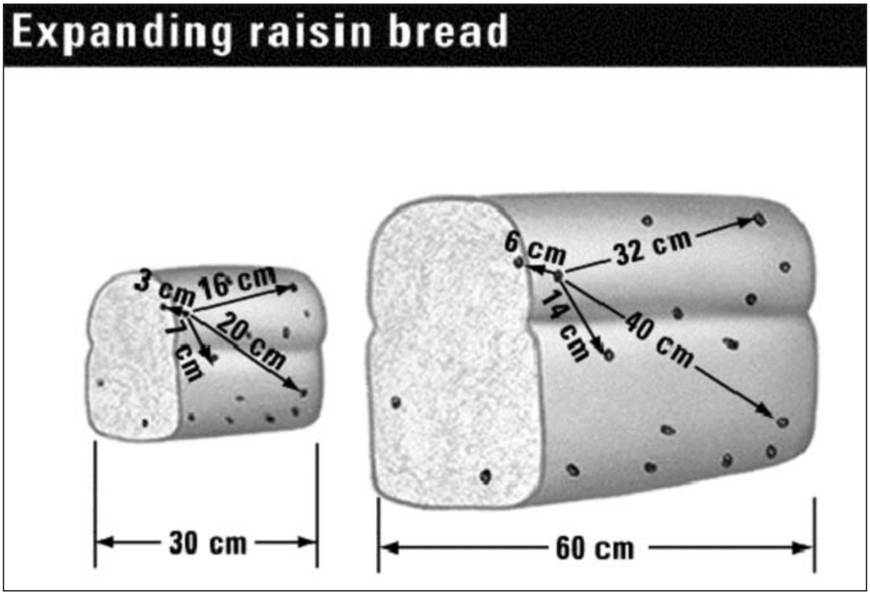

Fig. 2: The expanding universe analogue modeled as a loaf of rising raisin bread. From FRAKNOI. Voyages to the Stars and Galaxies, 2E. 2000 Brooks/Cole, a part of Cengage Learning, Inc. Reproduced by permission. www.cengage.com/permissions

are observers on the surface of one of them. As the loaf expands when the bread rises, each one of the raisins moves proportionally farther apart from all of the other raisins. It does not matter on which raisin you are an observer (analogous to which galaxy cluster you live in), all other raisins will be moving away from you. In this sense, there is no preferred observing location in the universe. Another way of saying this is that the Big Bang "happened everywhere at once".

While our understanding of gravity on the largest distance scales in the universe has been revolutionized during the past century, we have also been amazed by the discoveries on the smallest distance scales (the microworld). We have come to understand through the development of quantum mechanics that the microworld is far more subtle and rich in physics than we had ever imagined. Astonishingly, we have discovered that matter can behave simultaneously as if it were a particle and a wave. Of course none of this formalism could have been developed if scientists had not first studied the behaviour of particles in the macroworld (i.e., deterministic mechanics) and the properties of various types of waves (e.g., sound and light waves). These insights have revolutionized technology and its impact on human development and interactions has been nothing short of astounding. For example, our fundamental understanding of the organization of the periodic table of elements would not have been possible without quantum mechanics. The development of the transistor could never have taken place without this seminal research. This implies that we would have no transistorized means of communication and that the digital analysis of information (computers) would have been greatly impaired. It also implies that the imaging chips known as CCDs (charge-coupled devices) that were pioneered by astronomers, who needed them to record images of celestial objects, and which are now ubiquitous in webcams and other digital video devices, would not have been invented. Clearly, mankind would find itself in a hugely different environment than it does today if it were not for the innovations that came about as a result of fundamental scientific research.

The Universe in Perspective

Our universe is so immense that we do not measure distances in metres but in terms of light-years. One light-year corresponds to the distance that it would take light to travel in one year. This is an enormous distance since light travels at 300,000 km/s. To provide some context and background consider the following: the radius of the earth is about 0.02 light-seconds in length; in other words it would take approximately 0.01 seconds for a light signal to travel from Europe to North America. It takes about 1.3 seconds for light to go from the earth to the moon and about 8 minutes for light to travel from the sun to the earth. Thus if the sun were suddenly to go dark at noon tomorrow, we would not find out about it until 12:08 pm. It takes about 6 hours for light to propagate from the sun to Pluto. The distance to the nearest star from the sun is an incredible 4 light-years. There are about 200 billion stars similar to our sun all moving around a black hole at the center of our galaxy in various types of orbits. We know that our sun is located in the disk of our own Milky Way galaxy and that it takes roughly 250 million years for it to make one revolution around the central black hole. Our galaxy has a diameter of a little larger than 100,000 light-years and the nearest large galaxy closest to us (the Andromeda galaxy) is approximately 2 million light years away. It is also known that galaxies cluster in what are known as superclusters of galaxies. These superclusters typically contain 100,000 galaxies and can extend over distances of more than 100 million light-years. There are approximately one million superclusters in the observable universe thus leading us to conclude that there are at least 100 billion galaxies in the universe. If each star has (on average) one planet, then the number of planets that would be able to host intelligent life must be enormous. The distance scale of the observable universe is an impressive 10 billion light-years.

All of these astronomical inferences were made in lock-step with the fundamental discoveries made in physics, math, and chemistry. With all of this information, astrophysicists have been able to create a reasonably robust picture of the evolution of the universe. We believe that the universe emanated from incredibly hot, dense matter when the four fundamental forces of nature (gravity, electromagnetism, the weak force, and the strong nuclear force) were all of roughly equal importance. The universe subsequently went through a period of rapid inflation that caused it to become geometrically flat (light rays traveling along a path that is initially parallel will continue to travel along a parallel path and will neither intersect nor diverge). After the first 3 minutes following the Big Bang, the universe would have consisted mostly of ionized hydrogen (90%) and would have fused some of its hydrogen into helium (10%) and trace amounts of other light elements such as lithium and beryllium. After 400,000 years the expansion of the universe would have allowed it to cool sufficiently so that the ionized hydrogen could recombine into its atomic form. This marks the dividing line between the radiation-dominated era (the early universe) and the matter-dominated era (the epoch in which galaxies and other large-scale structures formed). At this time it is thought that the universe consisted of a more or less uniform density of hot hydrogen gas (including some helium gas). As a result of perturbations in the density of this material, some of the gas started to contract under its own gravity, allowing for the formation of the first generation of stars approximately 200 million years after the Big Bang. These massive stars produced enormous amounts of ultraviolet radiation that tended to re-ionize the hydrogen gas in the universe. Eventually the stars became gravitationally bound into larger groupings from which galaxies formed and finally superclusters of galaxies formed after that (about one billion years after the Big Bang).

We also know that the Big Bang occurred approximately 13.7 billion years ago and that our galaxy was formed 12 billion years ago. Our sun is approximately 4.6 billion years old and we expect it to live for another 6 billion years before it becomes a red giant and eventually grows so large that it envelops Mercury's orbit, then Venus's orbit until its atmosphere eventually gets close to the earth. At that time it will pulsate violently and shed most of its hydrogen gas back into the interstellar medium. What will remain is the burned-out core of our sun that is composed mostly of carbon and oxygen. This remnant is known as a white dwarf. So how can we predict, with any certainty, the future of our sun? The answer is that we can use the "laws" of physics combined with sophisticated computer modeling to simulate the birth, life, and death of our sun. Moreover, we can actually observe

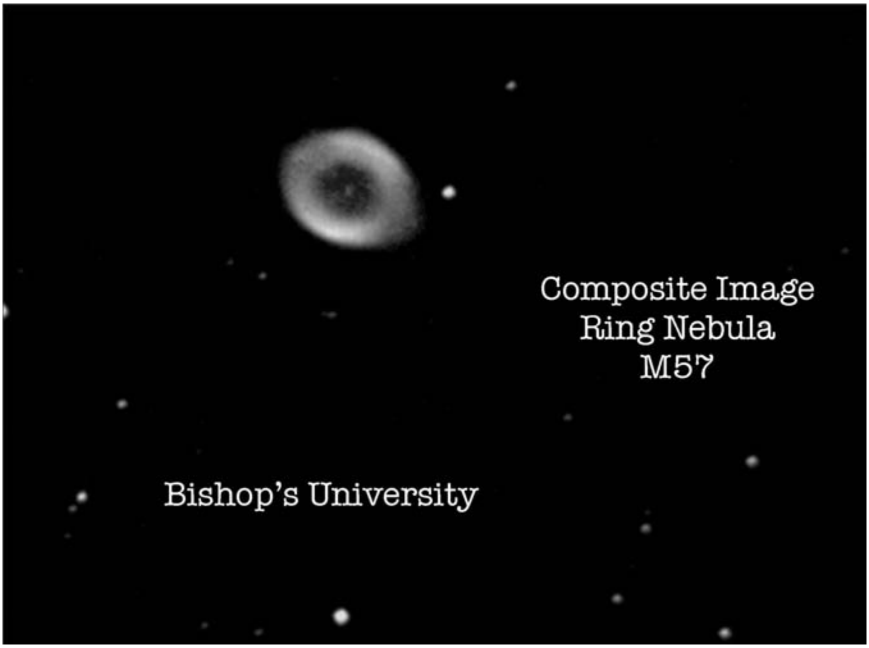

Fig. 3: The Ring Nebula (M57) as observed from the Bishop's University Astronomical Observatory. The ring around the central white dwarf was produced by the pulsating (dying) red giant about 1600 years ago.

the same process happening to stars similar to the sun in our Milky Way galaxy that are undergoing their final death throes (Figure 3).

It would seem as if we have amassed a huge amount of information concerning the formation and evolution of our solar system, our galaxy, and the universe. Although this is true, these determinations are often based on the assumption that we understand all of the physical phenomena that occur in our universe. This is certainly not the case. In particular, given all of its successes, Einstein's theory of General Relativity has not been tested in the limit of extremely strong gravitational fields or on cosmic distance scales. It is entirely possible that the theory will need serious revision. Moreover, we do not understand what makes up the dark matter that constitutes 95% of the matter in the universe nor do we understand the nature of the dark energy that constitutes 75% of the mass-energy of the entire universe. These are extremely important questions that must be addressed along with other subtle issues that have not yet been resolved and could have a significant impact on our understanding of the answers to these larger questions. These are some of the questions that are being addressed by the astronomers and physicists of the STAR cluster.

History Leading to the Formation of the STAR Cluster

Prior to 1988, Bishop's University had an extremely limited acquaintance with astronomy. This was a very unfortunate situation especially given the fact that a very large Observatory housing a 1.6 metre telescope was constructed in 1978 at Mont Mégantic[6] (about 70 km east of Sherbrooke). Bishop's had been offering one liberal science course in astronomy but no research was being done in this area. In 1988, Bishop's decided to hire an astrophysicist (Dr. Lorne Nelson) as a faculty member in the Department of Physics. Since that time the university has had a vigorous astronomy and astrophysics research program. Almost all of the Honours students in physics have been hired as summer research assistants (about 83% of the Honours students at Bishop's subsequently went on to graduate school to obtain Ph.D. degrees). They primarily carried out numerical simulations of stars and binary evolution using computers. Professor Nelson's main research interests were: (i) the study of brown dwarfs (failed stars that bridge the gap between ordinary stars such as our sun and giant gas planets such as Jupiter); and (ii) the development of a unified picture of the evolution of close interacting binaries (one star cannibalizes its orbital companion) containing compact objects such as white dwarfs, neutron stars, and black holes. In 2002, Professor Nelson was awarded a Tier 1 Canada Research Chair in astrophysics and was able to build significant research infrastructure such as cluster computers (i.e., dedicated supercomputers), to create a graduate (MSc) program and to hire postdoctoral fellows (Dr. Ajaja and Dr. Turcotte). With the subsequent hiring of Professor Valerio Faraoni in 2005 (who has considerable expertise in General Relativity and alternative theories of gravity), and the hiring of Professor Ariel Edery, astrophysics-related research became even stronger. In 2009 the STAR cluster was formally created and subsequently selected by the university as one of the four major areas of research focus. The current members of the cluster include Dr. Valerio Faraoni (Physics Department); Dr. Patrick Labelle (Physics Department); Dr. Lorne Nelson (Physics Department); Dr. Sylvain Turcotte (Physics Department); and Dr. Brad Willms (Mathematics Department).

Objectives of the STAR Cluster

The STellar Astrophysics & Relativity (STAR) research cluster's main areas of research in fundamental and applied physics include cosmology, astrophysics, general relativity, alternative theories of gravity, effective theories for low-energy quantum gravity, gravitational waves, the astrophysics of compact objects, interacting binary stellar systems, and high-energy astrophysics. The cluster and its members are also involved in the organization of conferences, workshops, and local seminars, host visitors for collaborative work and lectures, participate in various international activities (e.g., the time allocation process for the Gemini and Canada-France-Hawaii telescopes), and coordinate the outreach activities of the Bishop's University Astronomical Observatory.

Outside of the university, the members have many international collaborations and partners. Specifically, members of the cluster have ongoing collaborations with the Kavli Center for Space Research (Massachusetts Institute of Technology), Cambridge University, Oxford University, University of Chicago, Université de Montreal, University of Cape Town, University of Naples, University of California at Santa Barbara, International School of Advanced Studies (Trieste), the Chinese Academy of Sciences, Nagoya University, and the Albert Einstein Institute.

The main research themes that are being investigated by cluster members include the study of strong gravitational fields and the search for a good approximation to the fundamental theory of gravity with applications to cosmology, and the study of compact objects in various astronomical contexts with a focus on topics relating to high-energy astrophysics. Cosmology and compact objects (neutron stars and black holes), and the science of gravitational waves are the main areas of application of relativistic gravity and encompass a wide variety of astrophysical objects and phenomena that need to be understood. Research on compact objects (isolated or in binary systems) include studies of their formation history, number densities throughout the universe, and the signatures of gravitational waves radiated by them.

As mentioned previously, the "standard" theory of gravity is (naively) believed to be Einstein's theory of General Relativity (hereafter abbreviated as GR). However, when one tries to formulate a quantum version of gravity, a unification that has been done for the other three fundamental interactions, this theory leads to mathematical difficulties that cannot be eliminated without substantially modifying the theory. Quantum physics and high-energy physics necessarily modify GR, generating a wide spectrum of extended theories that deviate only a little from GR at low energy (and solar system) scales, but with large deviations at higher energy. These deviations can, in principle, manifest their effects on large (cosmological) scales, or possibly even at spatial scales intermediate between solar system scales (where GR is well tested and known to be obeyed in the weak-gravity regime) and cosmological scales (i.e., the scales of galaxies and galaxy clusters).

Cosmologists are also trying to explain the 1998 discovery that the current expansion of the universe is accelerated. This discovery, obtained by studying the relation between the luminosity of Type Ia supernovae and their distance, does not fit the model of a decelerating (yet expanding) universe that had been accepted until 1998. To remain within the context of GR and explain the cosmic acceleration, it is necessary to postulate a mysterious and otherwise undetected dark energy with extremely exotic properties (highly negative pressure). This dark energy could even take a very exotic form that violates the second law of thermodynamics cherished by physicists. It is prone to violent instabilities and may cause the universe to end in a Big Rip singularity at a finite point in time in the future. Many researchers dissatisfied with this ad hoc fix believe that the current cosmic acceleration could well be the first detected deviation of gravity from Einstein's theory. The corrections picked up by GR in the high energy regime may manifest themselves in cosmic rays, in highly energetic astrophysical events near black holes, or in gamma-ray bursts in binary systems. The gravitational waves emitted by these astrophysical objects carry with them the signature of the theory. No gravitational wave has been detected directly yet, but their discovery is expected sometime in the next ten years. Their detection and the study of their spectrum and polarization properties would shed light on the correct theory of gravity. We also note that the progenitors of Type Ia supernovae are unknown (a 40-year old problem in astrophysics) and thus it is critical that we determine their origin.

Cluster members plan to address the following problems:

- What are the modifications to GR that one can reasonably expect given a few basic assumptions about gravity? What are their effects on cosmology (expansion history, evolution of voids, formation of galaxies/clusters)?
- What is the gravitational wave content of extended gravity, how are gravitational waves generated, and what signatures of the theory should we look for in experiments detecting these waves?
- How would different descriptions of the gravitational radiation reaction affect the evolution of close interacting binary systems, and could these differences be detected?
- What model can be proposed that would explain the salient observations of Type Ia supernova explosions and also account for their observed frequency? Are these models consistent with the frequencies for all galaxy morphologies?

In order to achieve these objectives, some of the cluster members who have need of massive computing power will use the supercomputer at

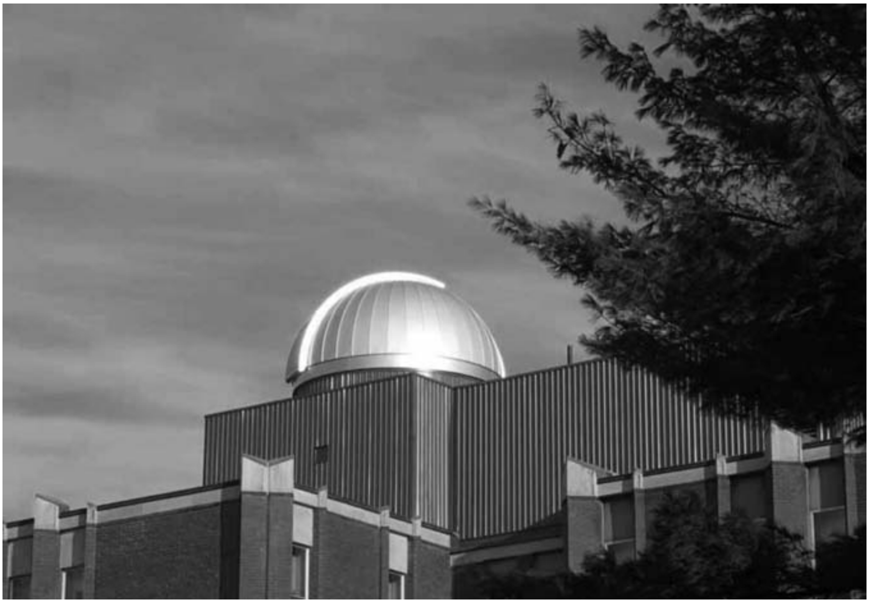

Fig. 4: The Bishop's University Astronomical Observatory on top of the roof of Nicolls building.

the Université de Sherbrooke of which we are full partner in the Réseau québécois de calcul de haute performance (RQCHP). The research effort will also benefit from the collaboration of undergraduate and graduate students who will be working on these problems under the supervision of cluster members. The training of Highly Qualified Personnel (HQP) will clearly be an important legacy of the cluster initiative.

Public Outreach in the Eastern Townships

From the earliest times, astronomy has provided civilizations with very significant stepping stones in the progression of human development. For example, our systems for timekeeping are largely derived from astronomical observations. Moreover, our calendars were developed so that our agrarian ancestors could plant their crops at the optimal times of the year so that they were less likely to lose them due to frost damage while at the same time maximizing the growing season and thus increasing the overall production. An intimate understanding of astronomy was also of paramount importance to sailors and other people who wished to circumnavigate the earth. Much of our mathematics and some of our geometry were developed in order to satisfy the needs of astronomical research. For example, the Greek astronomer Hipparchus devised a method for carrying out trigonometric calculations. Isaac Newton invented calculus primarily for the purpose of understanding astronomical observations (in relation to those on the earth). Things are not much different today as astronomical observations require huge amounts of computational resources. Not only are computers needed to carry out detailed simulations of various phenomena that we observe in our cosmos, but some astronomical projects amass more than one terabyte of data per day. These requirements drive computer-related industries to significantly improve their hardware and software offerings. It would not be an overstatement to say that astronomy has made a huge contribution to the improvement of the human condition.

We also cannot forget that astronomy plays an important role in educating our youth in getting them excited about science. Given the rate at which scientific knowledge increases, the ordinary citizen must have the literacy to appreciate some of the public-policy issues that arise from technological developments and have the ability to make informed decisions. Members of the STAR cluster are keenly aware of these issues and have been taking concrete steps to educate the public at large. In particular, through the generosity of its donors, Bishop's was able to build an astronomical observatory in 2006 (Figure 4). The observatory serves to educate and train our own undergraduate and graduate students, but it also serves the community's need for science outreach (Figure 5). The observatory has entertained K–11 students, CEGEP students, cultural groups, and the general public during its open-house events. Since its inauguration, nearly 3500 visitors have seen the observatory, and many of them have also been present for a lecture that is normally given before the observing sessions. This Powerpoint presentation is entitled "A Brief Tour of the Universe" and it is a powerful way for astronomers to convey the vastness and beauty of the universe to the general public. It is also a valuable way for individuals to interact with scientists and have their questions answered on an individual basis.

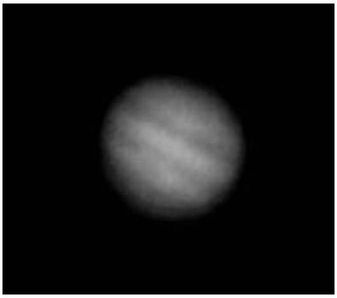

Fig. 5: The planet Jupiter as taken with the telescope at the Bishop's University Astronomical Observatory. Note that various colour bands can be seen in the atmosphere of Jupiter.

So why is astronomy so important? The bottom line is that it has made significant contributions within the cultural, technological, and scientific contexts. Astronomy is important in how it influences human creativity and how it inspires the creation of poetry and music.[7] From a scientific viewpoint, it allows us to ponder the important questions concerning where we came from, how it all started, and how it will all end. Technologically, astronomy has driven the development of complex pieces of optical equipment such as digital cameras and pushed the envelope when it comes to construction of supercomputers.

But above all else, when it comes to our understanding of why we participate in the scientific process and why we are so enthralled with the discoveries that we make, we should remember the words of Aristides Bastidas[8] who said "Science must be like the light of the sun, it must shine for everyone."

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NOTES

* The author would like to thank the other members of the cluster (in particular Professor Valerio Faraoni) for their input into the original cluster proposal (some of which is repeated here).

He would also like to acknowledge financial support from the Natural Sciences and Engineering Council (NSERC) of Canada and Bishop's University.

1 Quoted from chapter 19 of *The Adventures of Huckleberry Finn*, by Mark Twain.

2 See the seventh book of Plato's *The Republic*.

3 Technically electromagnetism has been unified with the Weak force of nature yielding the Electroweak force. Further unifications are possible with the Strong (nuclear) force leading to the Grand Unified Theory (GUT).

4 Reginald Aubrey Fessenden was born on October 6^{th}, 1866 in East Bolton (QC). He was enrolled as a student in Bishop's University but left in 1884 having nearly completed his degree. Although not completely definitive, Fessenden seems to have been the first person to ever make an audio radio transmission in 1900.

5 Note that the mass of four hydrogen nuclei is slightly greater than the mass of one helium nucleus. This difference (known as the mass defect) is reason for the energy generation.

6 The Observatoire Mont Mégantic (OMM) is continuing to be a mainstay of Quebec astronomy. Bishop's University is now a full-fledged member of the Centre.

7 For example, Bishop's professor Andrew MacDonald's tribute to the heavens: *Pleiades Variations; The Great Square of Pegasus*.

8 This quote was part of Bastidas' acceptance speech for the 1980 International Kalinga Prize awarded by UNESCO recognizing his contributions to the popularization of science and technology.

CLIMATIC AND ENVIRONMENTAL CHANGE: MONITORING, ADAPTATION, ACTION. THE NEW MULTI-SCALE CLIMATE AND ENVIRONMENTAL CHANGE (MUSCLE) RESEARCH CLUSTER

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Abstract
This paper presents the various research themes addressed by the members of the MUSCLE research cluster. The author attempts to explain how we can gain a better understanding of our climate system, monitor environmental changes and how these changes are linked to our society and can impact on it. Finally, it proposes a reflection on where we stand as a society in relation to climate change and presents some avenues to promote public awareness and involvement in order to be better prepared and adapt to potential future changes.

Résumé
L'auteure de cet article présente ici les différents axes de recherche abordés par les chercheurs associés au groupe de recherche MUSCLE. Les lecteurs seront ainsi amenés à mieux comprendre leur système climatique et les moyens utilisés afin de contrôler les changements environnementaux et leurs impacts sur notre société. Enfin, l'auteure propose une réflexion au sujet du rôle joué par la société dans la nouvelle réalité des changements climatiques. Elle présente certaines pistes qui appellent à une prise de conscience et à une plus grande implication sociale afin de mieux se préparer et s'adapter aux changements potentiels qui nous attendent.

The research cluster

One of the new research clusters at Bishop's University, the MUSCLE, is devoted to the monitoring of environmental and climate changes and to researching their impacts on ecosystems and society for adaptation planning purposes and public education. This cluster counts members from various departments and disciplines, from

Biology to Physics, to Computer Sciences and Geography, Chemistry and even Business. It was created in fall 2009, thanks to an initiative led by Dr. Valerio Faraoni (Physics Department) and subsequently assisted by Dr. Elisabeth Levac (Environmental Studies and Geography Department).

The MUSCLE cluster was awarded a Canada Research Chair with the goal of boosting research in this field. Dr. Matthew Peros, who holds the Tier II Canada Research Chair in Climate and Environmental Change, joined us at Bishop's this summer and will now coordinate the cluster. A strong researcher in his field, Dr. Peros is conducting research in the Canadian Arctic and Cuba, leading projects in paleoclimatology and in archeology. As such, his work corresponds to the idea of the research cluster: to combine the social aspects and scientific knowledge of environmental change. He will be the missing link between the widely different research programs of our cluster members which focus either on human, physical or technical aspects of climate and environmental research.

Introduction: Climate change and us

The "Environment" with a big E is on everyone's mind these days. Canadians perceive climate change as a bigger threat for the "vital interests" of our country than international terrorism, according to a recent survey commissioned by the Canadian Defence and Foreign Affairs Institute (Innovative Research Group, Inc. conducted the research between Dec. 22, 2009 and Jan. 4, 2010) (Stone, 2010). Back in 2004, a similar poll showed that Canadians' fear of these two threats was equal (52% for climate change versus 49% for terrorism). In 2010, the fears related to climate change remained relatively stable (falling only 3% to 49%) while fears about terrorism fell to 28% (Stone, 2010).

While only half of Canadians expressed fears about climate change, an even greater proportion (80%) believes there is solid evidence for global warming (Borick et al., 2011). South of the border, this proportion drops to 58% (Borick et al., 2011), which is a higher number than we ought to expect given the relentless efforts made to emphasize the "uncertainties" inherent to the scientific method (Oreskes and Conway, 2010).

Environment Canada reports that Canada experienced its warmest year on record in 2010 (Environment Canada, 2010). However, 2010 will not be remembered solely for its crippling periods of excessive heat; smog was also an issue of major concern in several parts of the country. It has been noted that air quality has in fact declined dramatically over the last few years, not only in the summer months but during the winter months as well (Environment Canada, 2008).

Environmental change is now almost irrefutable. Such change not only affects temperatures but can have numerous other impacts as well. Hence the name of the research cluster: climate and environmental change is complex, it involves numerous interactions between the atmosphere, lands, living organisms (including humans), and it operates on different time and geographic scales. We live (and think) in the present, but it is important to step back to be able to see how much, and how fast, our natural world has changed. The name MUSCLE thus stands for MUlti Scale CLimate and Environmental change.

This article divides into three sections: *ready!, set!* and *go!* The section titled *ready!* focuses on the monitoring aspect: how, how much and how fast is our environment changing? We will explore how researchers within our clusters are monitoring various aspects of environmental and climate change and their impacts. And if we talk about impacts, we have to realize that we, as humans, will also be affected. The section on adaptations (*set!*) will present the actions being planned by our governments in response to climate change. Although we share a certain responsibility in our present climatic and environmental situation, this section asks, are we ready to do anything about it? This is where our community can play the biggest role: action. That last section (*go!*) will be short, as it is a work in progress, constantly evolving. We are hoping to raise people's awareness about climatic change and to promote and support community-based research or action plans.

***Ready!* Monitoring climate and environmental change**

Monitoring climate and environmental change is an important aspect of this research cluster because it will help scientists anticipate their effects on society and on ecosystems. Monitoring will also provide the necessary tools to determine how key natural resources would be the most affected (hence affecting communities and the economy), and to identify what ecosystems would be especially sensitive to changes. Future actions and adaptation plans should be based on knowledge.

Climate in itself is a broad field. The field of environmental studies is broader still: it includes almost every aspect of our natural world, and it touches many parts of our society, especially if we consider that humans are also part of the natural world. This is why the members of the research cluster have defined a series of four research themes, each addressing a set of questions/problems. These are: Mechanisms of climate change; Impact of climate change/biogeography; Adaptation measures; Monitoring and data analysis. I will now discuss these four research themes.

Research Theme 1

Mechanisms of climate change

The main objective of this research theme is to understand specific aspects of the dynamics of climatic and environmental change (in the past and at present). Basically, it is an attempt to better understand how climate works and how environmental changes take place. The second objective, which is to monitor present climatic and environmental changes at various spatial (geographic) and time scales, is one very important research priority identified by the Intergovernmental Panel on Climate Change in their 2007 report (IPCC, 2007a).

Of course, this research cluster cannot address all the questions pertaining to climate and environmental change. Researchers grouped within this theme mainly seek to document the natural variability of climates in the past, identify the impact of large meltwater discharge events on the Canadian climate and study the production and dispersal of biogenic particles (pollen, mold spores etc) to the global aerosols (e.g. dust) budget in the atmosphere (Sokolik, 2001).

We know that Canada was located under a large ice sheet some 20,000 years ago. When deglaciation started, large pools of meltwater accumulated in some areas. This meltwater was released into the Atlantic Ocean in large catastrophic events. Knowledge and understanding of these past events is essential because as we look to the future, we see that the anticipated melting of Arctic glaciers and of the Greenland ice sheet will add significant amounts of freshwater to the surface waters of the North Atlantic Ocean. This can disturb oceanic circulation, responsible for bringing warm ocean currents and heat towards the higher latitudes. At present, the warm Gulf Stream travels towards the north, carrying heat. When this current reaches the Nordic Sea, the surface water masses cool down, become denser and sink to form deep water masses that circulate around the world at the bottom of the oceans and resurface some thousand years later. This is called the thermohaline circulation. When large amounts of freshwater are added to the oceans, thermohaline circulation is slowed and the climate around the North Atlantic Ocean cools (Broecker, 1999).

Factors causing change in the climate system, such as these large meltwater releases, are called “forcing”. There are numerous climatic forcings but most of us are particularly familiar with greenhouse gases (CO_2, methane) and volcanic dust.

In this digital era, we sometimes feel that satellites, radar, and other sophisticated detection equipments can provide us with all the data we need, and that computer models will be able to simulate how our climate system will react to various “forcings”. This is something of a misconception. If we want to use climate models to simulate future climate changes, we first have to test the models against "real" data, or replicate past climatic events. Until we have time machines, we will need to rely on what we call "proxy" data. An example of proxy is pollen grains preserved in lake sediments. These provide an indication of the type of vegetation growing around the lake, which in turn will allow us to reconstruct the air temperature. Other proxies will be used to determine the temperature of the sea surface, or its salinity. In essence, proxies are tools that are used to indirectly determine climatic conditions in the past, long before we had thermometers and monitoring stations.

Climate modelers also need all kinds of information about the past, as inputs into their models. Basically, they need to re-create past "settings": what was the ice extent? Where were large lakes located? What type of vegetation grew in various regions? What was the extent of the ice at various times in the past? And most importantly, climate modelers need to know about past climatic events in order to test their climate models for accuracy. If a model is able to re-create a given climatic event with the set of known settings and forcings, then that model should be able to predict future climate changes. Modelers can also use past climatic events as analogues for future climatic impacts of the present global warming trend (IPCC, 2007a, b). An example of analogue would be the large inputs of freshwater (meltwater) to the Atlantic Ocean during the deglaciation. These affected the thermohaline circulation and the climate, and as such could be used to estimate the impact of a melting Greenland ice sheet on the sea surface conditions in the North Atlantic. Would the melting of the Greenland ice sheet result in large changes in oceanic circulation and even in abrupt climate changes? Estimating the impact of meltwater on the ocean is one of the projects to be carried out by this cluster (Levac et al., 2011).

We sometimes feel that we know everything about the last ice age and the deglaciation period (the last 15,000 years) that followed. Actually, more research is needed about these time periods. We need to know more about the drainage of meltwater to the oceans. We need to know what major episodes of meltwater drainage occurred along the Eastern Canadian Seaboard during the last deglaciation, and when they precisely occurred (Alley and Agustdottir, 2005; IPCC, 2007a). We need to identify the sources and the oceanic paths of these large meltwater discharge events, and determine if these large releases of freshwater corresponded with (or caused) major climatic events in the past (IPCC, 2007a). One important cooling episode occurred some 8200 years ago (Alley and Agustdottir, 2005) and recently published data shows evidence for a large meltwater drainage event occurring right before the start of the climatic cooling (Levac et al., 2011). Earlier, another event called the Younger Dryas caused a large cooling and resulted in the return of tundra-like vegetation and the growth of glaciers in many places. Some data about the impact of the Younger Dryas event on sea surface water conditions in the North Atlantic will be published soon (Levac et al., in preparation).

We also need to know more about the continental climate (air temperature) and ice extent during the last ice age and deglaciation. This is where Dr. Peros' expertise will be valuable. Dr. Peros has done extensive field work in the Canadian Arctic. Using a variety of proxy indicators, and especially pollen, he has studied the evolution of the Holocene (the period covering the last 10,000 years) climate and reconstructed air temperature for that region (Peros and Gajewski, 2008; 2009). Some of this work falls within our second theme: the impact of climate change (next section).

Dr. Peros is proposing to pursue his research on Arctic paleoclimatology and paleoecology by examining areas that might have been ice-free during the last glaciation. Pollen records from northern Yukon Territory would provide climatic information going back tens of thousands of years. This is precious because most paleoclimatic records in Canada only go back some 8000–10,000 years. The Canadian Arctic is a key area in terms of climate because it will be the most affected by global warming (IPCC, 2007a).

Dr. Peros is not only seeking to identify what forces are influencing climatic and environmental change (using various proxies), his research programme also addresses the constraints these environmental changes impose on human societies and the opportunities they provide for cultural change. Thanks to his background in archaeology, he is also assessing how humans have impacted the natural environment in the past. More will be said about this in the discussion of our third theme: adaptations measures to climate change.

Research Theme 2

Impact of climate change: biogeography and hydrology

If the climate and the environment are to change, we ought to expect that our ecosystems will be affected as a result. The objectives of this research theme are to study the present day biogeography (the distribution of organisms and ecosystems), to determine its links with various environmental factors (such as temperature, precipitation, soil types etc.), and to track modifications of ecosystems and of their evolution following environmental changes (IPCC, 2007a).

Consider global warming and think about living organisms. You will start wondering what species of insects, animals or plants will be affected by climatic and environmental change and how much. We cannot tackle all of the organisms living in our ecosystems, so our researchers are targeting insects, plants and birds.

The researcher who is studying insects is Dr. Jade Savage. She notes that individual insect species distributions are heavily controlled by temperature (and thus climate changes), and that many species of flies have extended their distribution range northwards over the last seven decades. She will therefore seek to gain greater knowledge of the impact of environmental and habitat changes on diversity and species composition. We need to understand the response of whole communities, not just of single species, to climate changes (Savage et al., 2009). Since climate changes in the Arctic and in alpine habitats are generally more dramatic than in lower latitude/altitude ecosystems, we need to monitor how insect communities are affected by various climatic factors in alpine and arctic ecosystems, especially along natural transition zones. We need to do the same in relation to insects' habitat/landscape, as these might also be affected by climate change.

Plants will also be affected by global warming and its associated impacts (IPCC, 2007). Dr. Robert Van Hulst is studying the effects of climate change on Quebec plants, both at the theoretical level and in the field. Wendy King is studying the effect of fires on the vegetation of Australia. We will see in the next section that vegetation (especially forests) belongs to what the provincial government calls the *natural capital* and is identified by the federal government as one of the important natural resources in this country. Dr. Van Hulst's research will be in line with past research conducted by Dr. Peros, who has studied the way tree populations responded to rapid climate changes (Peros et al., 2008).

Global warming will not only affect plant distribution, it will also have indirect impacts on phenomena such as pollen production. Airborne pollen has been studied in Sherbrooke and a pollen calendar has been created (Levac, 2011). Airborne pollen and mold spore concentrations have also been compared with weather parameters by two former Bishop's students (Sandercombe, 2006; Stretch, 2007). Data is collected every year in order to see how pollen and spore yields are affected by climate. The goal is to anticipate how global warming will affect pollen production and hence allergy problems.

An important component of ecosystems, which is often missed, is the set of geochemical reactions occurring in soils, plants, water, etc. Dr. Elizabeth Prusak is proposing to study specific biochemical reactions made more rapid by changes in temperature and humidity.

In our climate, we are usually not too sensitive to water issues, except for brief drought periods in the summer when we cannot make open fire due to risks of forest fires, and when floods occur. What will be the impact of global warming on river hydrology? Dr. Norman K. Jones has recently studied the recurrence of floods in the region (Jones, 2008a) and has also examined their links with climatic parameters over the years (Jones, 2008b). He has considerable experience in field studies of rivers and alpine/arctic glaciers. Three researchers (Drs Faraoni, Heidi Webber, Brad Willms) are interested in theoretical modeling of groundwater flow and glacier dynamics. Although the media is quick to report on melting glaciers and collapsing ice shelves in Antarctica, glacier dynamics are not fully understood and the role of temperature changes on bottom lubrication and ice flow in alpine glaciers is unclear but important (Paterson, 2001).

Research Theme 3

Research on adaptation measures to climate change

Research in this theme seeks to determine how we can adapt to climate and environmental change. How can the capacity of cities, rural areas, and other communities to anticipate, adapt to, and benefit from environmental change be assessed? This assessment can be done by examining the resilience, adaptability and transformability of a socio-ecological system (if we consider that humans and human societies are a component of ecosystems we can talk about socio-ecological systems).

Socio-ecological resilience is the capacity of a system to absorb disturbances and to reorganize while undergoing change so as to still retain essentially the same function, structure, identity and feedbacks. In other words, how do we keep the system functioning in a way that is as similar as possible to the past? When changes exceed our capacity to absorb them without significant modifications to our functioning, we talk about adaptability. A step further, when the existing system is made untenable by climate change, we then talk about transformability, which is the capacity to create a new stable system when ecological, economic, or social structures cannot maintain themselves (IPCC, 2007b). The goal of all this is to identify and propose societal and economic changes or adaptations in order to respond to and/or limit the impact of environmental change (IPCC, 2007b).

A good understanding of the interrelationships between the changes in natural environment and the changes in society is also needed. We need to analyze the link between the environment and aspects of society such as institutions, governance and policy-making, the economy and public education. Locally, this translates into efforts to increase awareness and involve the public, the students and larger institutions (e.g., Bishop's University) into habitat or energy conservation efforts. How can we do this? This will be examined in the third section (*Go*!).

Many of our members are doing research in this theme (Drs. Darren Bardati and Tom Fletcher) or are active either in outreach and conservation projects locally (Dr. Fletcher, Jeffrey MacDonald) or on the Bishop's campus (Keith Baxter, Michel Caron). Examples of implications in local outreach and conservation projects include the Société de conservation du corridor naturel de la rivière au Saumon (MacDonald), Memphremagog Conservation Inc. (Fletcher) and the Sierra Club (Fletcher).

The best example of a link between environmental change and society are the research projects our colleague Darren Bardati is conducting on community involvement in conservation projects (Bardati 2006; Bardati and Bourgeois, 2008). Dr. Bardati is now involved in a vast project, "Challenges of Coastal Communities in the Face of Climate Change," funded by a $1 million grant over 5 years (2010–2015) awarded by the Social Sciences and Humanities Research Council of Canada (SSHRCC), through the Community-University Research Alliance (CURA). The goal of this project is to foster the development of resilience in communities lying along the coasts of the St. Lawrence River, estuary and watershed. This will be done by sharing knowledge about environmental changes and by helping communities to develop strategies to cope with the environmental and political impacts of climate change. Numerous community groups as well as government agencies are involved in this project, the following among them: Southern Gulf of St. Lawrence coalition on sustainability, Stratégies Saint-Laurent, Conseil du bassin versant de la rivière Bonaventure, Observatoire global du Saint-Laurent, Agence de santé publique de la Côte Nord, and the Mikmaq of Prince Edward Island. For more details please see the web link in Appendix 1.

At this point, it is necessary to examine how people have reacted to climate and environmental changes in the past. Dr. Peros has studied coastal archaeological sites located near mangroves in Cuba and reconstructed the local paleoenvironments in which these people lived (Peros et al., 2007; Cooper and Peros, 2010). In the future, Dr. Peros intends to study the prehistoric environmental-human interactions in the Caribbean. Among other things, he will document the hurricane activity during the Holocene, using storm-surge overwash deposits from lagoon sediments that indicate past hurricane strikes. Paleo-storm records are needed to assess the hurricane return period in the context of global warming, and to plan for future events in coastal communities. Closer to us, Dr. Peros wants to examine the effects of the Younger Dryas Cold Period on Paleo-Indian populations.

Research Theme 4

Monitoring and Data Analysis

Environment and climate change studies with the goal of environmental monitoring are primarily based on the analysis of data collected from different sources. New tools and techniques must therefore be developed or adapted (IPCC, 2007a). The principal automatic sources of data collection are measurements provided by satellites, aerial, or ground sensors. On their own, these bits of data can appear meaningless. The data must be analyzed by using key techniques such as image processing methods in remote sensing, photogrammetry, and Geographic Information Systems.

Two of our researchers, Dr. Madjid Allili and Dr. Layachi Bentabet, have a rich mathematical background in computational topology, differential geometry and statistical mathematics, and use this to design reliable techniques and powerful algorithms for image data analysis and GIS (Bentabet et al., 2003; Rana, 2004; Allili et al., 2007; Bonk, 2007).

Nowadays, research on climate and environmental change involves huge amounts of data from numerous locations. Large scale trends are impossible to see with statistical tools. It is also difficult to visualize spatial relationships that exist within the digitally stored data. This is why mathematical tools are needed. They are also needed to model groundwater flow, glacier dynamics, aerosol dispersion, animal and plant populations, and their response to multi-scale climate change. Other potential applications include land-use planning, natural resource management, wildlife habitat analysis, and natural hazard assessment, all applications of major importance at local, national, and international levels.

Other researchers in the MUSCLE cluster propose to develop theoretical and mathematical models of alpine and arctic glaciers as indicators of climate change and of changes in groundwater flow (Dr. Faraoni and Dr. Willms). Dr. Webber works at modelling soil water and crop water use in order to identify agricultural systems vulnerable to water deficit and soil salinization and to propose possible adaptations (Webber et al. 2006; 2009).

Sometimes, large-scale or long-term trends are only visible when large datasets are analysed and signals are extracted (Peros et al., 2010). Dr. Peros will continue to use this type of analysis to extract information from large paleoenvironmental and archaeological database. The goal is to examine interactions between climate, vegetation, and people over large spatial scales. Right now, his regional foci are northern Canada and the Caribbean, but Dr. Peros' work should include the Eastern Townships in the coming years.

Set! Planning Adaptation Measures to Climate Change and Identifying Research Priorities

Our governments, at the national, provincial and even at the municipal levels, believe in climate change and have plans to address various impacts climate change will have on society. Preparedness requires knowledge and involves a great deal of research. Some of our cluster's research goals clearly match some of the governments' research priorities.

Federal research priorities

At the national level, we will examine the research priorities of three major federal agencies: Canada Environmental Assessment Agency, Natural Resources Canada, and the Meteorological Service of Canada. Their current priorities relate to climate change, its impact on ecosystems and society, and to the anticipation/adaptation to climate change, including sustainable development (NRCAN, 2009; CEAA, 2009). I will briefly mention which members are involved in each topic.

The Canadian Environmental Assessment Agency identifies shifting climatic conditions and associated social changes as major challenges (CEAA, 2009), as does the Social Sciences and Humanities Research Council of Canada (SSHRCC), which finances the large research project Challenges of Coastal Communities in the Face of Climate Change in which our colleague Darren Bardati is actively involved. They have invested $1 million to study climate change adaptation and to foster academic-community partnerships.

Natural Resources Canada (NRCAN, 2009) acknowledges that natural resources are directly affected by climate change, for example forests, fire, and insects (Savage), biodiversity (King, Levac, Peros, Savage, Prusak, Dr. Stephen Yezerinac), conservation (MacDonald, Baxter, Fletcher), and groundwater (climate change affects precipitation and storage in glaciers) (Bardati, Jones, Faraoni, Willms).

Natural Resources Canada (NRCAN, 2009) also underlines that the study of paleo-environmental records of climate change is essential for policy-making, to create realistic scenarios of potential impact, and to verify climate models. Paleoclimatic records are used to assess the natural variability and thresholds of climatic systems (Allili, Bentabet, Jones, Levac, Peros), and these subjects have been identified as priorities also by the Meteorological Service of Canada. Finally, the role of clouds and biogenic aerosols (Levac) needs to be incorporated in climate models.

The provincial government is clearly showing a desire to act on climate change, at least on paper. The *Plan d'action 2006–2012 sur les* *changements climatiques* of the ministère du Développement durable, de l'Environnement et des Parcs du Québec states that « La lutte contre les changements climatiques exige des actions immédiates et concertées » (the fight against climate change demands immediate and concerted actions) (MDDEP, 2006). This action plan includes a programme for climate monitoring (Jones, Levac, Peros), as climate changes affect population security and have major economic impacts (Baxter, Fletcher, MacDonald). This plan also aims at reducing greenhouse gas emissions, and Bishop's University has made many important changes to reduce its emission among which the implementation of geothermal energy and new heating systems (Caron).

Along with the Action Plan for Sustainable Development (*Plan d'action de développement durable*) (MDDEP, 2008), the Quebec government presented a list of sustainable development indicators used to monitor progress made in Quebec in this field (MDDEP, 2009). One of the dimensions listed in *Natural Capital* is biodiversity, which relates to some of the objectives of our cluster (Savage, King, Yezerinac, Van Hulst, Levac). Other dimensions of *Natural Capital* addressed by our cluster are forests, surface waters (Jones, Faraoni, Willms, Webber), air quality (Levac) and climate (Jones, Willms, Levac, Peros). Water is a precious resource, lacking in certain areas, and Dr. Webber is looking for methods to use water resources more efficiently in agriculture (Webber et al., 2006; 2009).

One of the sustainable development indicators used by the Quebec government, *Human Capital*, includes education (MDDEP, 2009). Undergraduate and graduate training taking place in our cluster relates to this priority. A number of graduate students are actively involved in the research projects of many of our cluster members, as well as many undergraduate students working as summer research assistants in the laboratories. Moreover, each year, a number of undergraduate students choose to tackle a research project of their own and produce an honours thesis. This year in the Environmental Studies and Geography department, one honours student assessed the feasibility of building a self-sufficient home in the Eastern Townships (Klinck, 2011). Another student studied the effect of recent global climate change on the spring migration of some Ontario bird species (Kryczka, 2011). A different example of honours thesis is the use of historical GIS (geographic information systems) to track land-use change in downtown Sherbrooke over the last 150 years (Gkotsis, 2011).

Outreach activities and awareness efforts also fall within the scope of education (MDDEP, 2009). Many of these dimensions of society and sustainable development are also emphasized by UNESCO. Members clearly involved in such activities are Fletcher, Baxter, Kingsley and

MacDonald. Some of these members have also recently published textbooks in this field of studies (Faraoni, 2006; Fletcher, 2010).

_Go_! Are We Ready to Take Action?

As discussed earlier, climate change is perceived as a threat to our society. Is the fear serious enough to lead to action or is lethargy preventing us from doing so? It is difficult to answer that question because results of surveys have changed from year to year.

In 2007, a report from the Finance Department stated that few Canadians were ready to change their habits or to make financial sacrifices to save the environment, even if most believed in global warming (The Ottawa Citizen, May 23, 2007). The same article, however, mentions another government poll (conducted by a different firm) showing contradicting results, finding that about 60% of Canadians would be in favour of a new green tax.

In 2008, the main conclusion of a larger poll of 12,000 citizens from 11 different countries (including Canada) was a distinct lack of enthusiasm for international efforts to fight climate change: the public was becoming reluctant to make personal sacrifices (Canwest News Service, November 27, 2008). The poll also underlines a growing dissatisfaction with the government's perceived inaction resulting from its focus on indirect actions such as increasing taxes on fossil fuels, encouraging individual environmentally friendly activities and participating in international negotiations. Instead of these types of indirect actions, 55% of respondents in 11 countries think governments should take direct actions and invest in green energy sources. In 2011, this perception towards the government has not changed: 68% of Sherbrooke residents believe the government in place is taking no measures at all (or too few measures) to counter global warming (Gilbert, 2011).

Despite our discontent with the lack of concrete measures to counter climate change, we still expect others, including the government, to lead actions to protect the environment. When the Community Foundation of Canada took the "pulse" of Canadian Communities in 2010, it concluded that we believe we can make a difference but that we lack the motivation to do so. When they are aware of environmental issues affecting their community, most Canadians will expect the government or other citizens to address these local issues (*http://www.vitalsignscanada.ca/nr-2010-public-opinion-survey-e.html*). Locally, we are no different than most Canadians. One honour's student, Evelyne Gilbert, surveyed people in Sherbrooke, Quebec and Yamaguchi, Japan and found that in both countries a strong proportion (65% and 72%) of residents are expecting either their governments or Non Government

Organizations (35% and 32%) to lead the social changes necessary to counter global warming.

When we compare recent surveys with those conducted in 2007 and 2008, we do note one significant change: we are now ready to consider investing. A 2011 survey reveals that 73% of Canadians now say they would accept paying an extra $50 per year in energy costs to support the production of renewable energy (O'Neil, 2011).

While we are ready to commit monetarily, most Canadians admit to being lazy and resisting changes in lifestyles (Community Foundation of Canada, 2010). This does not mean that the situation is hopeless, but might indicate rather that the issue is perceived by many to be too vast to handle (O'Neil, 2011). Jacques Languirand, radio host for Radio-Canada, speaks of procrastination and suggests cutting large tasks into a set of smaller ones (*Par Quatre Chemins*, Radio-Canada, March 27th, 2011). This is actually a plausible course of action in this particular situation. People are more willing to act if they don't feel the task is overwhelming and if they see immediate results. 70% of Sherbrooke residents compost, 90% recycle, 82% use ecobags (Gilbert, 2011). With these three simple actions, we see the results: the amount of material ending up in the garbage bins is dramatically reduced. We are far less committed in gestures that would really reduce the amount of CO_2 produced, such as walking and biking instead of driving (40%) or using public transit (only 20%) (Gilbert, 2011).

It is obvious that we are waiting for some leaders to show us the way and set us in motion. Energetic young people with good ideas and initiative might be what we need. Even small projects can make a difference and acting locally is important.

Bishop's University students have been especially active in a number of green initiatives. Small universities are in an excellent position to raise awareness in their communities due to their small size and close connection with the community, and to initiate societal changes, promote innovation and facilitate public involvement. Student groups such as the Sustainable Development Action Group (SDAG) and the Environment Club have already had a real impact on decision-making in the campus community.

Successful initiatives were led by SDAG at Bishop's University, including the "Think Global, Drink Local" campaign in 2009. Bishop's University became the first campus in Quebec to ban sales of single-use bottled water after a student referendum in March 2010. SDAG members are working to increase the percentage of campus waste that is recycled or composted. Printing from campus computer is now recto-verso by default. To promote sustainable forms of transportation, a bike-sharing program called Gaiter Gears has been proposed. Finally, the Lennoxville Plastic Bag Initiative seeks to have plastic bags banned from our borough.

Another student group, the Bishop's University Environmental Club, is working hard at raising student awareness about environmental issues and at promoting student initiatives on campus. Promotion activities include sustainability fairs, town clean-ups, car-free days. The club has proposed to buy a dishwasher for the Gait (on-campus bar) instead of using disposable glasses and beer mugs. Apparently small but useful and readily applied actions!

At the municipal level, not only did the city of Sherbrooke implement selective garbage collection, including the separate collection of compostable material, the city has also created "La Brigade Verte," which employs young people each summer. Among other things, they promote lawns with a greater biodiversity!

It would be unfair to take credit for the great work done by our students. You are therefore strongly encouraged to visit their web sites (Appendix 1). Similarly, since this article only summarizes the work performed by our research cluster and gives a very brief overview of my colleagues' research, its web site will give you a more detailed description of the various projects under way (Appendix 1).

This research cluster hopes to foster innovative research into the monitoring of environmental and climate change and to promote tighter links between the researchers and the general public in order to make our community more resilient to changes, maintain or even improve its quality of life.

APPENDIX 1: WEB LINKS

Challenges of coastal communities in the face of climate change
http://www.ubishops.ca/research/whats-new.html.

Plans to implement geothermal energy at Bishop's University:
http://www.ubishops.ca/fileadmin/bishops_documents/services/SDAG/AMERESCO.pdf

Sustainable Development Action Group and Bishop's University Environmental Club: *http://www.ubishops.ca/sustainability-and-environmental-actions-at-bishops.html*
http://www.ubishops.ca/sustainable-development-land-use/index.html

Multiscale Climate and Environmental Change research group at Bishop's University: *http://www.ubishops.ca/research/research-units/multi-scale-climate-and-environmental-change-research-group.html*

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A POLLEN CALENDAR FOR THE MAIN ALLERGENIC POLLEN TYPES IN THE BOROUGH OF LENNOXVILLE (SHERBROOKE), QUEBEC

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ABSTRACT

Airborne pollen and spores concentrations were monitored daily in the Lennoxville borough (city of Sherbrooke, QC) during the 2006, 2007 and 2008 pollen seasons (spring and summer). The data were used to create a pollen calendar of the anemophilous pollen types that are most abundant in the air of the borough. The calendar shows when these plants can be expected to pollinate. Trees and shrubs (birch, poplar, maple, and alder) pollinate in the late-winter and spring, with pollen season stretching from April to May. The pollination seasons of pine and oak usually extend from mid-May to mid-June.

Grass pollen is abundant from mid-June until the end of August. Pollen from the weed categories, which is composed mainly of ragweed, begins to be recorded in the late summer, usually in early August. The pollen season for weeds ends in September or October, depending on the occurrence of frost.

The pollen season appears to be consistent from year to year for most genera or pollen categories, but the pollen seasons for the earlier pollinators exhibit greater variability, especially for the start of the season. This is easily explained by the great variability in weather (temperature, snow cover) that occurs in April in Lennoxville.

RESUMÉ

Les concentrations aériennes de pollen et de spores ont été étudiées de façon journalière dans l'arrondissement de Lennoxville (à Sherbrooke, QC) durant les saisons de pollinisation de 2006, 2007, et 2008 (printemps et été). Les données récoltées nous ont permis de créer un calendrier pollinique des types de pollen anémophiles les plus abondants dans l'air de cet arrondissement. Les arbres et les arbustes (bouleau, peuplier, érable et aulne) pollinisent à la fin de l'hiver et au printemps, et leurs saisons de pollinisation s'étalent d'avril à mai. Le pin et le chêne pollinisent généralement de la mi-mai à la mi-juin.

Le pollen des Poacées (Graminées) est abondant de la mi-juin jusqu'à la fin août. Le pollen des mauvaises herbes, constitué surtout de pollen d'herbe à poux, est enregistré à la fin de l'été, habituellement à partir du début d'août, et sa période de pollinisation se termine en septembre ou en octobre, avec l'arrivée du gel.

Les saisons polliniques de la plupart des genres d'arbres ou des différentes catégories (Poacées, mauvaises herbes) montrent une certaine constance d'une année à l'autre. Toutefois, le début de la pollinisation des pollinisateurs hâtifs est influencé par les conditions météorologiques du mois d'avril ainsi que par le couvert de neige à Lennoxville.

Introduction

Seasonal allergic rhinitis, also known as "hay fever," affects a large number of Canadians. Worldwide, the prevalence of hay fever is on the rise (Savage and Roy, 2005). Based on a 1996 survey conducted by Health Canada, the prevalence of allergic rhinitis in children aged 5 to 9 is 11% (Dales et al., 2004). The proportion is even higher in Canadian adults: 22% are affected by seasonal (spring-summer) allergic rhinitis (Keith et al., 2007). Allergic rhinitis is an inflammation and hyper-responsiveness of airways caused by an exposure to allergens that triggers an immune reaction and the production of histamine, irritating the lining of nasal passages (Collins, 2005). Pollen is the most common type of allergen found in the atmosphere (Meyer-Melinkian et al., 1996; Burge, 2002) and most of that pollen is from anemophilous plants, i.e. plants that are pollinated by wind, not by insects or other vectors (Bassett, 1978).

The most common symptoms associated with seasonal allergy to pollen include a runny nose, nasal congestion, repeated sneezing, as well as itchy and watering eyes (Perks, 2000). Some 27% of people affected by allergic rhinitis also have asthma, and 17% will develop chronic or recurrent sinusitis (Keith et al., 2007). Exposure to outdoor aeroallergens (pollen and spores) is also an important cause of severe asthma hospitalization and morbidity in Canada (Dales et al., 2004). The direct and indirect costs of asthma in Canada are not negligible, as they are close to those of infectious diseases, hematological diseases or perinatal illnesses (Krahn et al., 1996).

While most seasonal allergy sufferers do not experience life-threatening symptoms, 25% of them cannot tolerate their symptoms without treatment, and about 60% will use over the counter medications, prescriptions, or a combination of both (Keith et al., 2007). Sales of various allergy medications and airborne pollen concentrations are closely linked (Laaidi, 2000). Nevertheless, 20% of allergy sufferers complain that they cannot control their symptoms during the worst month of the year (Keith et al., 2007).

Most types of allergenic pollen and spores affect allergy sufferers during a period of only a few weeks each year which we will call the *pollen season* (or pollinating season). And fortunately, most people are allergic to only a few pollen types, not all. Since this pollen season occurs at about the same time every year for a given plant, it is possible to create a pollen calendar with a few years of data. Typically, in the Eastern Townships, deciduous trees and shrubs tend to release their pollen prior to leafing, usually in April or May. Most coniferous trees pollinate later in the season and produce pollen in May and June, as does oak. The pollination peak for grass is in July and August. Weeds (including ragweed) start pollinating in early August, and produce pollen throughout August and September, until the occurrence of the first frost (Bassett et al., 1978).

Pollen calendars can help allergy sufferers (and health providers) anticipate when the pollen they are allergic to will be present in the air, and can be an important tool to anticipate the seasonal peak in pollen production, since the most severe allergic symptoms coincide with this peak (Chappard et al., 2004). Creating a pollen calendar of the main allergenic pollen types found in the air of the Lennoxville borough of Sherbrooke, Quebec (approximately 150 km east of Montreal) was one of the goals of the pollen monitoring program at Bishop's University, and is the subject of the present paper.

Pollen calendars are available for other cities (e.g. Montreal, Ottawa) but they cannot be used in Sherbrooke as plant pollination times vary with location. Pollen was monitored in 1983–1984 at Sherbrooke Airport (Labre, 1987) but the surrounding vegetation is different there and can pollinate later due to the higher elevation and colder weather conditions (Latorre, 1999). Therefore, the pollen calendar presented here will be the first for the borough of Lennoxville, Sherbrooke.

The usefulness of pollen calendars is limited by the fact that the exact start and length of the pollen season can exhibit large yearly variability at any given location, depending on climatic conditions (McDonald, 1980). For example, a cold late spring will delay the beginning of the flowering season (Latorre, 1999). Daily *in situ* pollen monitoring is therefore necessary to determine if pollination has indeed started for a given plant.

Airborne pollen concentrations can also vary greatly from day to day, and even during the course of a day, with weather conditions. To maximize chances for fertilisation, anemophilous plants release massive amounts of pollen when weather conditions are optimal for dispersal towards individuals of the same species. In general, warm, dry conditions lead to higher airborne pollen concentrations (i.e. sunny days) while rainfall negatively affects pollen concentrations, as pollen grains act as nuclei for rain drops (Makinen, 1977; Rosenfeld, 2001; Levac et al., 2007).

Hence, the daily pollen monitoring programme at Bishop's University was started to study the relationship between various weather parameters and airborne pollen concentrations. The long-term goal is to improve our daily pollen forecasts, an aspect of this research that will be examined in a subsequent article. A survey conducted by *Reactine™* in July of 2006 indicated that 69% of Canada's allergy sufferers would greatly benefit from pollen forecasts that could enable them to avoid triggers and symptoms (Canada NewsWire, 2006) and reduce the costs to the health care system (Krahn et al., 1996).

Setting

Pollen samples were collected at Bishop's University, in the city of Sherbrooke, Quebec. The campus is located in the borough of Lennoxville, which is approximately 7 km from downtown Sherbrooke, at the junction of the St. Francis and Massawippi Rivers. The campus is on the edge of a small urban centre surrounded by agriculture lands and mixed forests. The most common trees are pine (*Pinus*), spruce (*Picea*), balsam fir (*Abies*), cedar (*Thuja*), hemlock (*Tsuga*), larch (*Larix*), maple (*Acer*), birch (*Betula*), poplar (*Populus*), oak (*Quercus*), elm (*Ulmus*), willow (*Salix*), basswood (*Tilia*) and beech (*Fagus*). Shrubs grow in the understory and along the rivers, with alder being the most abundant (Rousseau 1974).

Methods

A Burkard 7-day Hirst-type volumetric sampler (Hirst, 1952) was used to collect pollen samples. This device was selected because it is highly efficient for such purposes (Peng and Chen, 1996). The pollen trap was located on the roof of the Johnson Building at Bishop's University at the recommended height of 10 metres above ground. According to the American Academy of Allergy, Asthma and Immunology (AAAAI) and the National Allergy Bureau (NAB), pollen and spore samplers should be placed a minimum of 10 metres above ground level in order to retrieve a representative pollen sample from the surrounding area. This is what the paleoecologists would call the local pollen rain (Faegri and Iversen, 1989). Because most of the pollen responsible for allergies is produced by plants that evolved to be wind pollinated, it is readily picked up by wind and stirred into the atmosphere. This is why air samplers are typically placed well above the ground.

Air is drawn into the pollen sampler at a rate of 10 litres per minute, thanks to a small electric motor located in the body of the sampler. A vertically-mounted drum is placed inside the sampler, right in front of the intake slit. A piece of Melinex tape covered with a thin layer of petroleum jelly is wrapped around the drum, which turns clockwise at a rate of 2 mm per hour, or 48 mm per day. Therefore, all particles contained in the air, including pollen, stick to the coated tape as the air is pumped through the slit into the sampler. When the tape is removed from the sampler, it is cut in 48 mm-long sections, each section representing a 24 hour period. Each tape section is mounted on a labeled slide. A glass cover slip is placed over the tape section and sealed with clear nail polish.

The pollen grains on each slide were identified, counted and recorded using transmitted light microscopes (usually a Nikon Eclipse 50i) at 400X magnification. Spores were counted but not differentiated. Counts were done for 2 hour intervals (The British Aerobiology Federation Handbook, 1995). Quality control was maintained by ensuring the microscope was carefully calibrated (by measuring the size of the field of view using a micrometer) and by making duplicate counts of pollen from the same slide periodically throughout the season. These duplicates were counted by two different trained specialists.

Pollen was identified to the genus level for trees, and to the family level for some types of grasses (e.g. *Poaceae*) or weeds, using a pollen reference slide collection prepared from flowers harvested on identified trees, grasses and weeds growing locally, and using pollen reference books (Bassett et al., 1978; McAndrews et al., 1973). Raw pollen counts were converted into pollen concentrations (grains/m^3 of air sampled) using a conversion factor (see The British Aerobiology Federation Handbook, 1995).

Pollen samples were collected daily from April until the first frost in 2007 and 2008. Samples were analyzed from April 23 to September 5, 2007 and again from April 8 to September 5 in 2008. Preliminary work was also done in the spring of 2006, when pollen samples were collected from the beginning of May to the middle of June. While the 2006 collection season was of short duration, it nevertheless covered the weeks during which the tree pollen production peaks were observed, but missed most of the grass and all of the weed pollen seasons.

Seasonal calendars were compiled for the 2007 and the 2008 pollen seasons following the method proposed by Andersen (1991) and eliminated the outliers near the beginning and the end of the pollination season. Odd pollen grains can be resuspended in the air by strong winds long after pollination has ended, and even into the following spring. The pollination season is therefore defined as 95% of the season's total pollen for a given genus. Outliers are defined as any pollen occurring outside of the 95% range. The pollination season is considered to start when a species' total pollen count reaches 2.5% of the total amount of pollen collected in that season. The pollination season ends when a species' total pollen count reaches 97.5% of the total amount of pollen collected in that season. Other methods for determining the start and end of the pollination season use different percentages (e.g. Makinen, 1977; Nilsson and Persson, 1981) but Andersen's method allows us to ignore the small percentage of eccentric pollen while still acquiring a good representation of seasonal pollen release.

The average pollen calendar (Table 3) combines data from 2006 to 2008 and is based on the average concentrations. The thresholds used are shown in Table 3a and are from the AAAAI. We combined the low and moderate categories as the pollen concentrations show high interannual variability at the beginning and end of the pollen season. The high or very high categories correspond to the peak of pollination. Note that some taxa can display two peaks.

Results

Trees make up almost 95% of the total airborne pollen load in Lennoxville, the remaining 5% consisting of pollen from the weeds and grass categories (Sandercombe, 2007) (Figure 1). Among the trees, pine and maple are by far the most abundant, accounting for 70% and 13% of the overall tree pollen load, respectively (Figure 2) (Sandercombe, 2007).

Airborne pollen types collected in significant concentrations in Lennoxville are pine (*Pinus*), maple (*Acer*), poplar (*Populus*), birch (*Betula*), oak (*Quercus*), grass (*Poaceae*). Other pollen types were found but in smaller concentrations. These include fir (*Abies*), alder (*Alnus*), walnut (*Juglans*), spruce (*Picea*), tamarack (*Larix*), willow (*Salix*), cedar (*Thuja*), basswood (*Tilia*), elm (*Ulmus*) and ragweed (*Ambrosia*). Mold and fungal spores are ubiquitous in all samples.

The start of the pollen season (as defined by Andersen et al., 1991) for the tree category (as a whole) shows interannual variability (see Tables 1 and 2). The pollen season extended from May 2 to June 20 in 2007, while in 2008, it extended from April 18 to June 21. Year 2006 is not shown in the tables since the sampling season was too short.

When individual tree genera are considered, we can note differences between 2007 and 2008, not only in the timing and length of the pollen season but also in the dates the pollen season peak occurs as well as in the maximum pollen concentrations attained at that peak.

Pine Phenology

The 2007 pollen season for pine extended from May 25 to June 20 (Table 1). In 2008, the season started later (June 3) but ended on the same date (Table 2). Pine pollen concentrations peaked in the middle of June (Figure 3) for all 3 years during which pollen was monitored in Lennoxville (2006–2008), however the maximum pollen

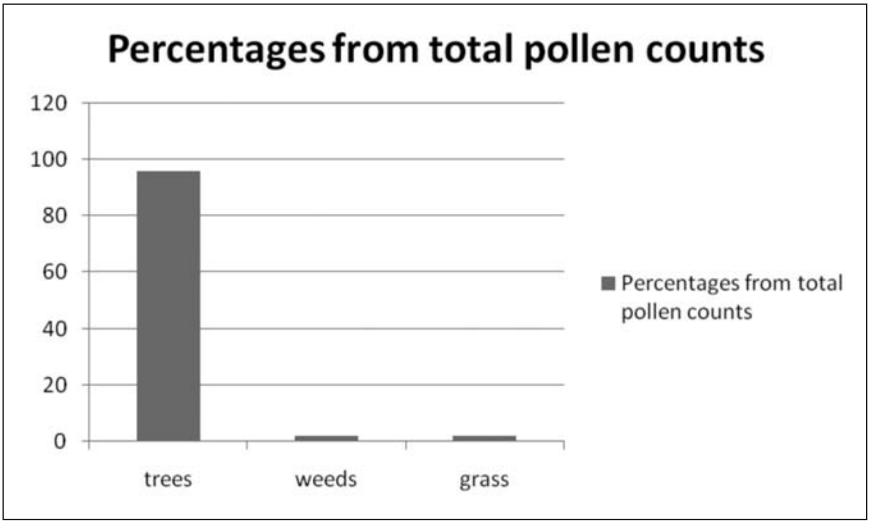


Figure 1: Proportion of the three main pollen categories for Sherbrooke, Quebec, showing percentages from total pollen numbers, based on data from 2006–2008.

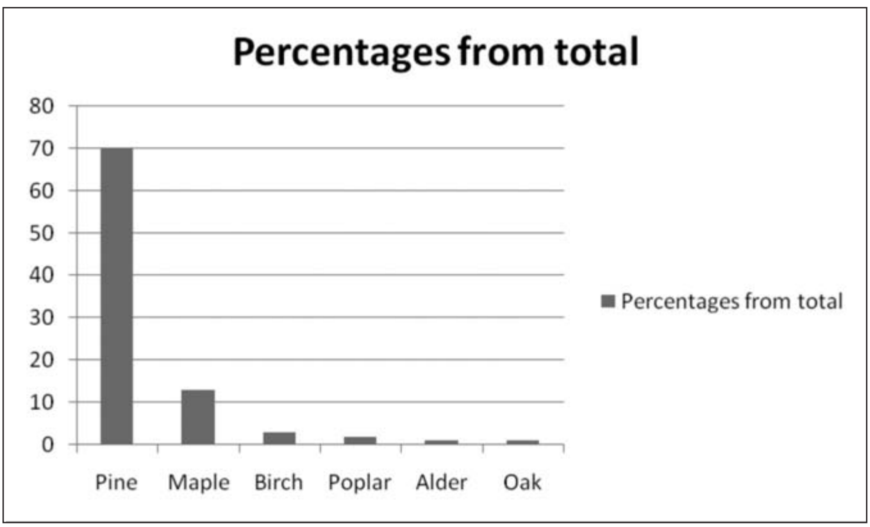
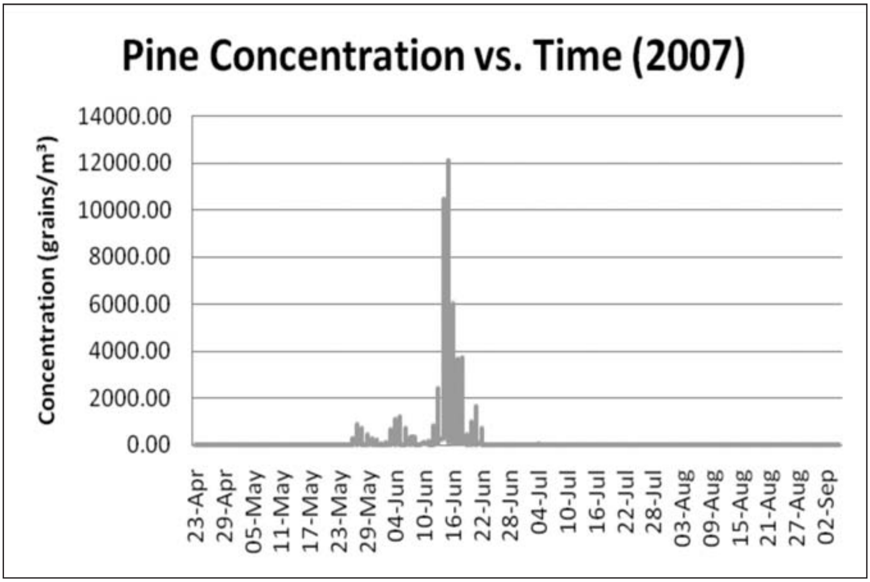


Figure 2: Proportion of various tree genera in the overall airborne pollen load for Sherbrooke, Quebec, based on data from 2006–2008.

concentrations during the peak were greater in 2007, reaching 12,000 grains/m^3 compared to 5000 grains/m^3 in 2008 (Figure 3).

Poplar Phenology

The pollen season for poplar was already underway when the monitoring was started on April 23, 2007 (Table 1) (monitoring was



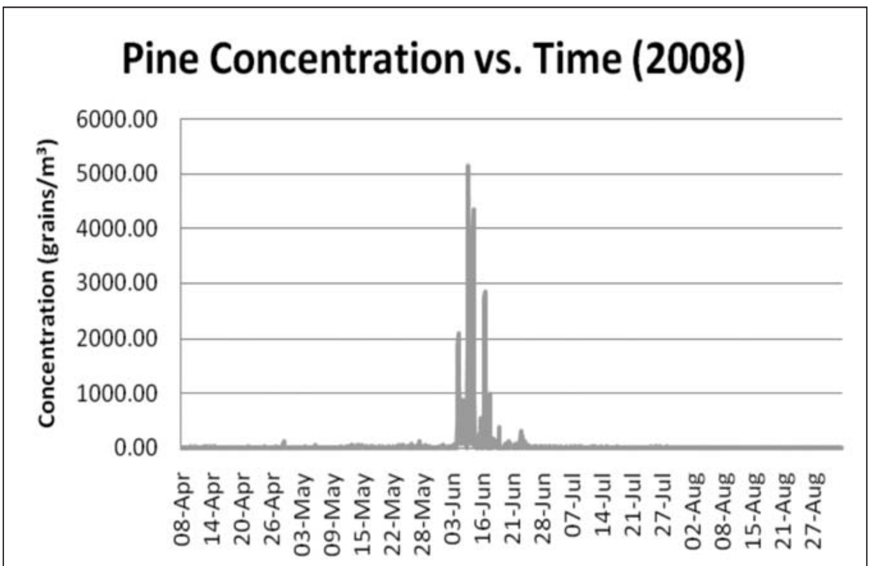


Figure 3: Evolution of pine pollen concentrations in Sherbrooke, Quebec from April to August 2007 and 2008 (From Stretch 2009)

2007 Pollen Calendar																						
	April				May				June				July				August				September	
Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
Poplar			■	■	■	■																
Maple				■	■	■	■	■														
Oak					■	■	■	■														
Birch						■	■	■														
Pine								■	■	■	■											
Grasses								■	■	■	■	■	■	■	■	■	■					
Weeds																	■	■	■	■	■	■
Spores					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Table 1: Pollen calendar for Sherbrooke, Quebec, based on data from the 2007 pollen season, for genera or categories with significant concentrations (yearly total concentration >2000 grains/m³) (Modified from Stretch 2009)

2008 Pollen Calendar																						
	April				May				June				July				August				September	
Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
Poplar			■	■	■	■																
Maple			■	■	■	■	■															
Oak			■	■	■	■	■	■	■	■												
Birch					■	■	■	■														
Pine							■	■	■	■	■											
Grasses								■	■	■	■	■	■	■	■	■	■	■	■	■		
Weeds																	■	■	■	■	■	■
Spores			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Table 2: Pollen calendar for Sherbrooke, Quebec, based on data from the 2008 pollen season, for genera or categories with significant concentrations (yearly total concentrations >2000 grains/m³) (Modified from Stretch 2009)

started late because of abundant remaining snow on the roofs). In 2008, the pollen season started on April 14 (Table 2) and for both years, it ended on May 12. Pollen concentrations peaked essentially on the same dates for both years (Figure 5), but peak pollen concentrations were greater in 2008, reaching 500 grains/m^3 compared to 170 grains/m^3 the previous year (Figure 5).

Birch Phenology

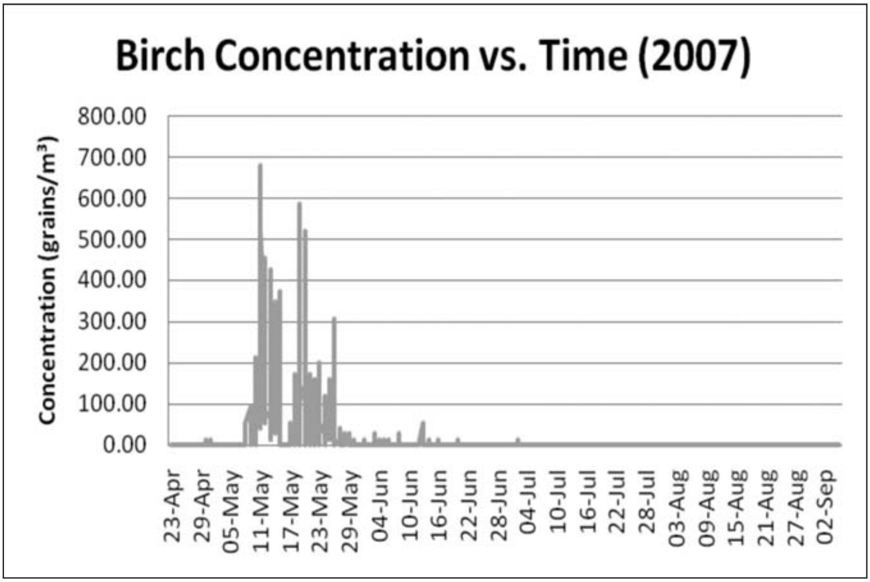
Birch is another genus that displays variations in the starting date of its pollen season, but not in the ending date. In 2007, the pollen season stretched from May 8 to 29, while in 2008, it stretched from May 1 to 30 (Tables 1 and 2). However, the peak concentrations and the dates for the peak occurrence were similar for both years (Figure 4).

Maple Phenology

The length of the maple pollen season was the same in 2007 and 2008, but it started later in 2007, when it extended from April 22 to May 30, while it extended from April 15 to May 25 in 2008. Peak concentrations do not show significant differences between the two years.

Oak Phenology

The oak pollen season had a very sudden onset in 2007: oak was not recorded in the sampler for the first week of sampling, but oak started to pollinate suddenly on April 30. The season ended on May 29 that year. The oak pollen season was much longer in 2008 because it started



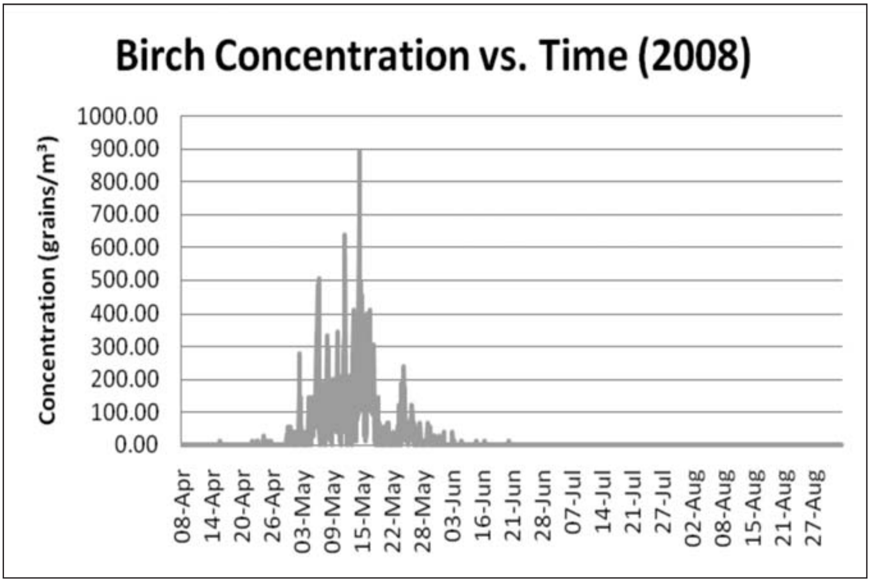
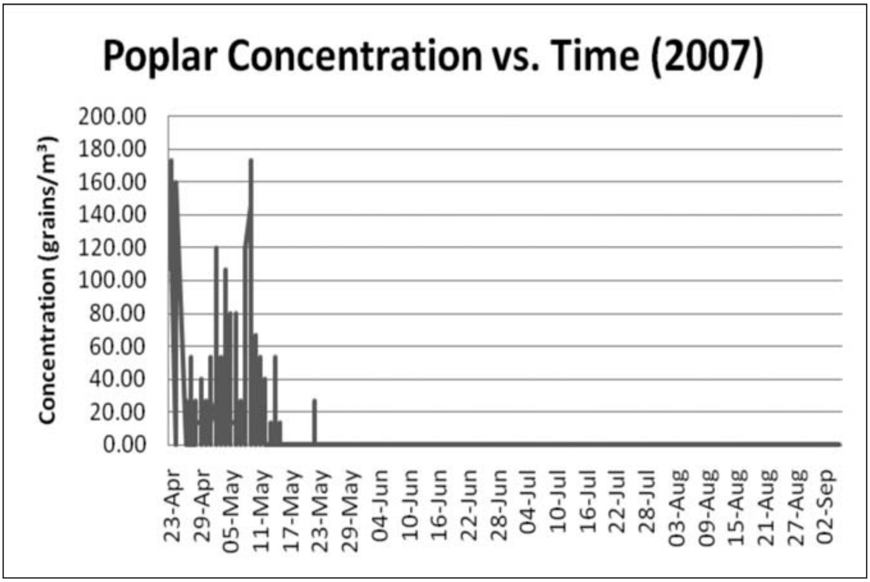


Figure 4: Evolution of birch pollen concentrations in Sherbrooke, Quebec from April to August 2007 and 2008 (From Stretch 2009)

on April 16 and ended on June 16 (Tables 1 and 2). The peak pollen concentrations were the same for 2007 and 2008, but the timing of the peak occurred slightly later in 2008 (Figure 6). The overall season for oak also stretched over a longer period of time (Tables 1 and 2).



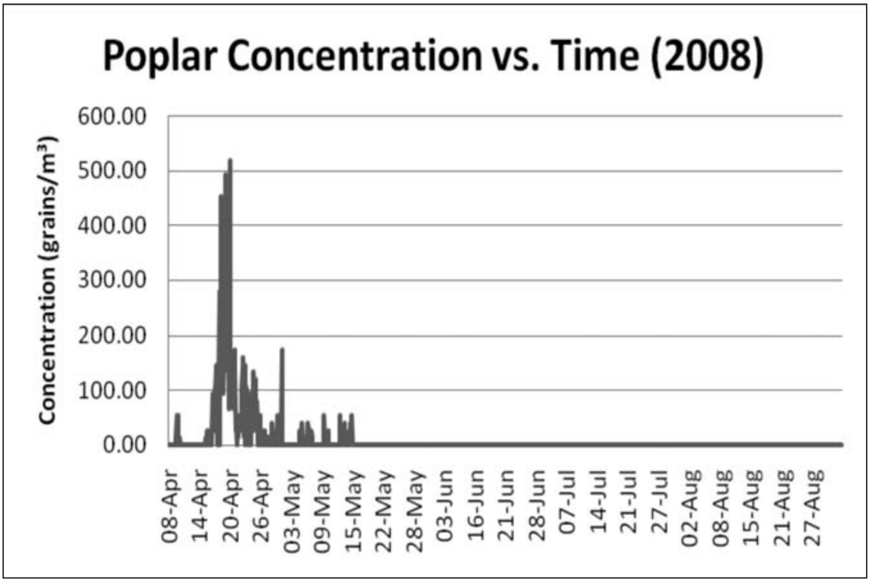
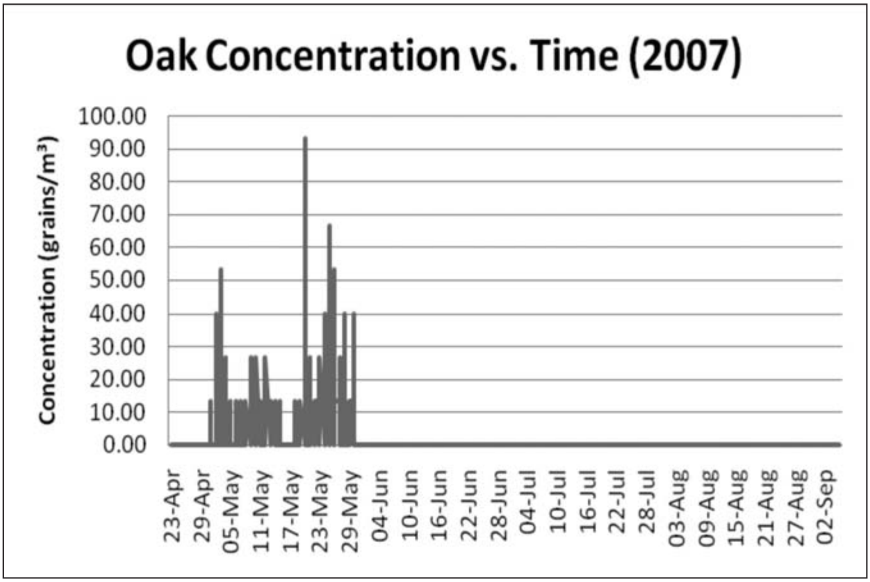


Figure 5: Evolution of poplar pollen concentrations in Sherbrooke, Quebec from April to August 2007 and 2008 (From Stretch 2009)

Alder Phenology

Low concentrations of alder pollen were collected in April and May for both years, but alder was not included in the pollen calendar because concentrations remain low and sporadic. We possibly have insufficient data because alder is one of the earliest pollen producers and its pollen season might start in early April, before we could start the monitoring.



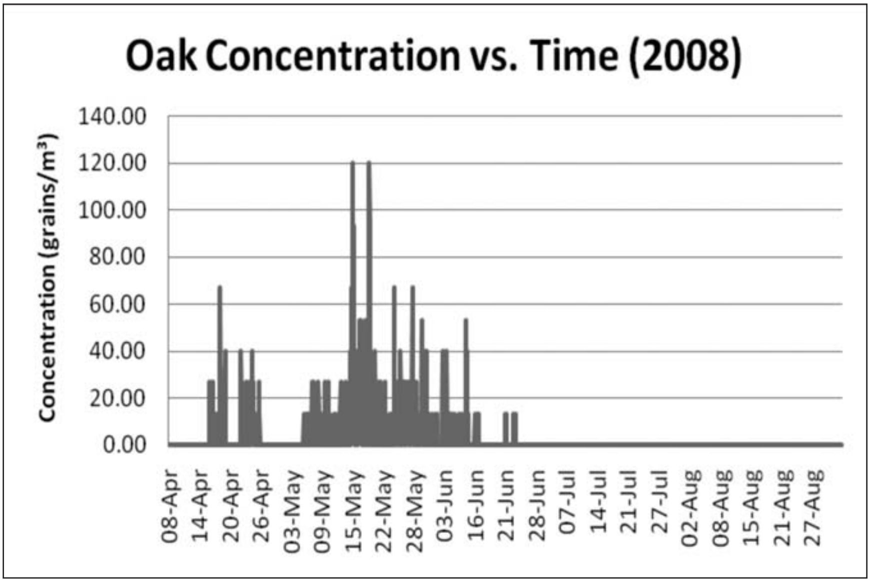
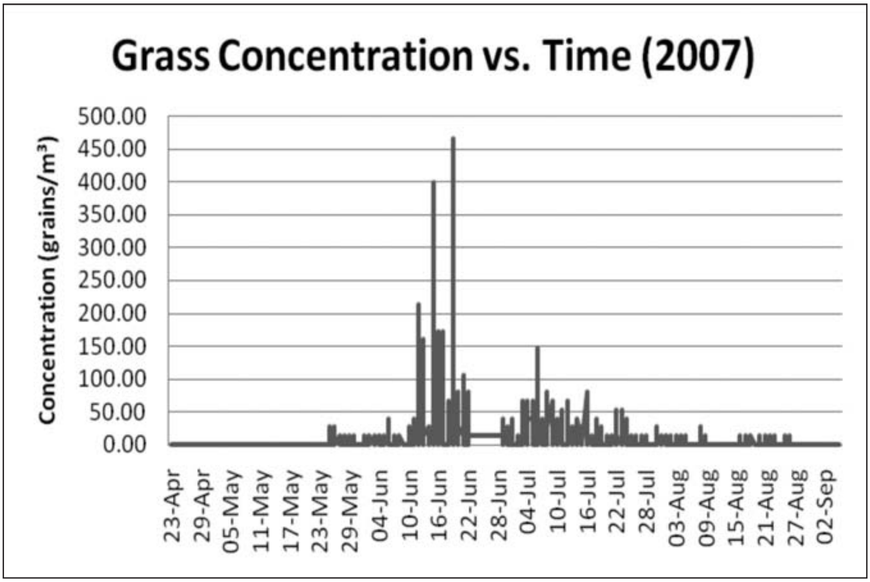


Figure 6: Evolution of oak pollen concentrations in Sherbrooke, Quebec from April to August 2007 and 2008 (From Stretch 2009)

Grass Phenology

The start of the pollen season is more consistent for the grass category, but it is the overall length of the season that varies in this case. In 2007, the pollen season for grass was from May 29 to August 4, while in 2008 the pollen season was three weeks longer, stretching from May 25 until August 27 (Tables 1 and 2). Average grass peak concentrations



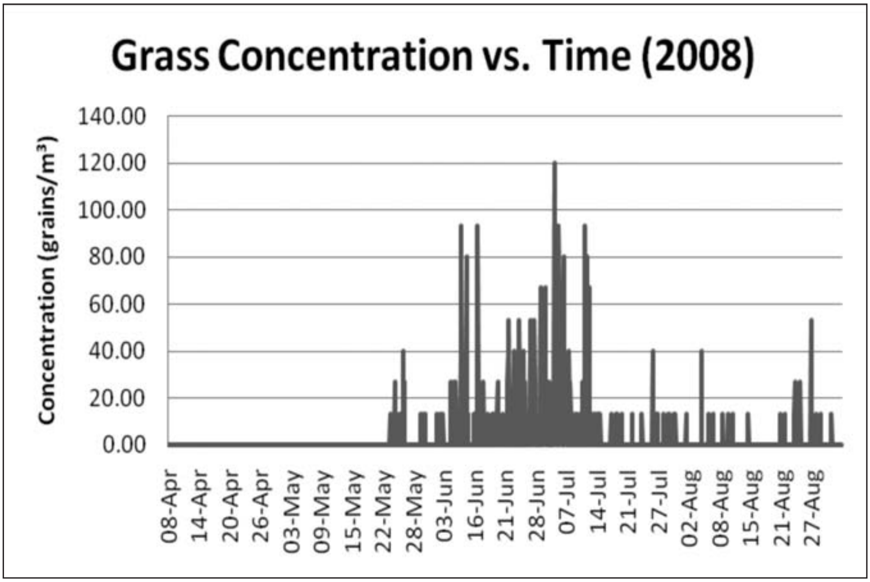


Figure 7: Evolution of grass pollen concentrations in Sherbrooke, Quebec from April to August 2007 and 2008 (From Stretch 2009)

went from 500 grains/m^3 in 2007 to 140 grains/m^3 in 2008 (Figure 7). The peak in grass pollen also occurred later in 2008 (Figure 7).

Weeds Phenology

Among all the pollen categories, weeds are the most constant with pollen seasons starting on August 4 both years and ending on

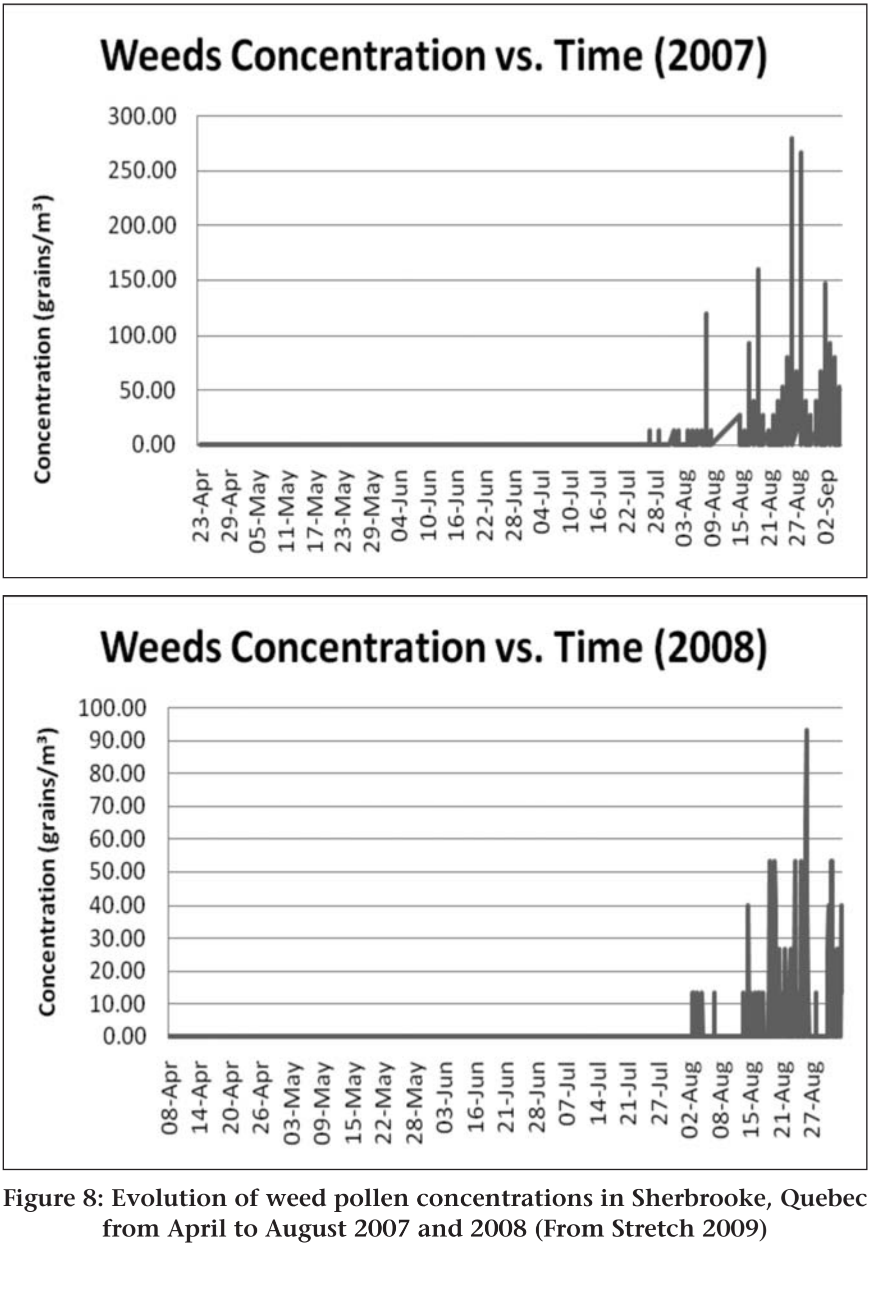


Figure 8: Evolution of weed pollen concentrations in Sherbrooke, Quebec from April to August 2007 and 2008 (From Stretch 2009)

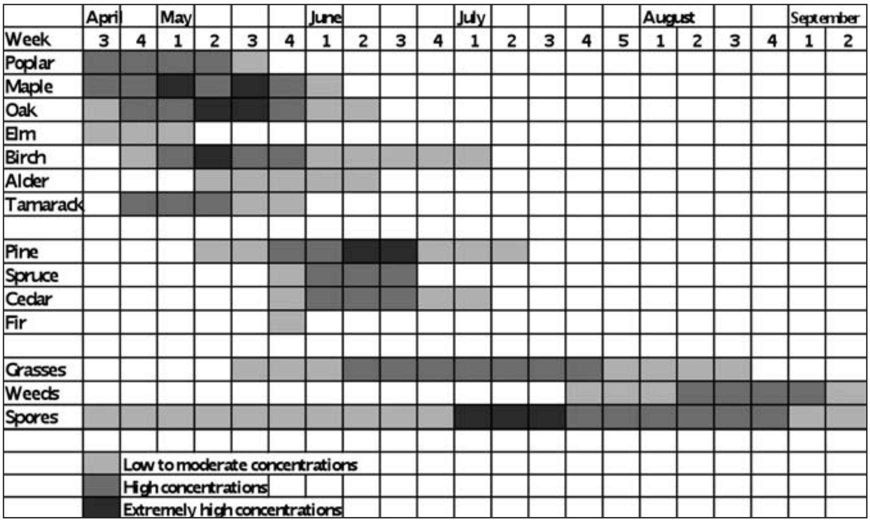


Table 3: General pollen calendar for Sherbrooke, Quebec, for the most abundant pollen types, based on data from 2006–2008. The standard thresholds from the AAAAI were used to classify the average pollen concentrations into the low-moderate, high or very high categories. Thresholds are shown in table 3a.

	Trees	Weeds	Grass	Spores
Absent	0	0	0	0
Low	0–14	0–9	0–4	0–6499
Moderate	15–89	10–49	5–19	6500–12999
High	90–1499	50–499	20–199	13000–4999
Very High	˃1500	˃500	˃200	˃50000

Table 3a: Thresholds from the American Academy of Allergy, Asthma and Immunology (2006).

September 5 and September 1 in 2007 and 2008 respectively. Finally, peak concentrations for weed pollen (mainly *Ambrosia*) went down from 300 grains/m^3 in 2007 to less than 100 grains/m^3 in 2008, but the peak in concentrations had essentially the same timing both years (Figure 8).

Table 3 is based on the average concentrations of the three years and it displays taxa that are not discussed here (elm, tamarack, spruce, cedar, fir). These taxa are represented by smaller numbers of pollen grains which obscure annual trends. The occurrence of willow, walnut and beech is too sporadic; hence they are not included in the calendar.

Discussion

The composition of the airborne pollen load does not reflect that of the surrounding vegetation, but this was expected: anemophilous trees produce greater quantities of pollen than trees with entomophilous pollination (Faegri and Iversen, 1989). Among the anemophilous trees, some will also produce much greater quantities of pollen and will tend to be over-represented in the pollen rain. This is the case for pine and maple (Delcourt and Delcourt, 1991).

Weather conditions appear to influence the start of the pollen seasons but the data gathered so far is insufficient to verify this statistically, with only two full pollen seasons (2007 and 2008). Nevertheless, we can link certain trends with the weather conditions we experienced in Lennoxville in the late winter, spring and summer. Snow melted late in April 2006 and April 2007 because temperatures remained relatively cold (this is the main reason why the pollen sampler was not deployed earlier those 2 years). In 2007, the cold April weather was followed in May by a few weeks of above-normal temperatures with dry weather. In 2008, even though snow melted relatively early in April, temperatures for the month of May were colder than normal (Environment Canada, 2008).

If we examine the pollen season of early spring pollinators (poplar, birch, oak, maple), we can identify some common trends. The 2007 birch and maple pollen seasons were delayed by a week relative to 2008. We can only assume the same for poplar, but this genera starts pollinating much earlier in April and the data collection started too late in 2007. The oak season started suddenly on April 30, 2007, as if it was waiting for snow to melt. These results are consistent with Latorre (1999) and McDonald (1980).

While colder weather in April appears to delay the onset of early pollinator pollen seasons, it seems to have little impact on the end of their pollen seasons and on the timing of production peaks. That is the case for poplar, birch and maple, for which the date of pollen production peak seems constant from year to year. For birch and maple, the average concentrations also seem unaffected by climatic conditions. Oak appears to be an exception: the cold April 2007 weather delayed the onset of the pollen season, the colder-than-normal temperatures in May 2008 corresponded with a delay in the peak pollen concentrations.

The data collected for pine, the only abundant late spring pollinator in Lennoxville, suggest that its pollen season and pollen production is also affected by climatic conditions. The warm weather of May 2007 corresponds to an early onset of the pollen season and for concentrations more than twice those of the previous year. It was the reverse situation the following year: the cold weather of May 2008 corresponded with a delayed onset of the pollen season and lower concentrations.

The lower airborne grass pollen concentrations recorded in 2008 can be directly related to abundant and frequent precipitation events in Lennoxville, as also found in other studies (Makinen, 1977; Rosenfeld, 2001). Precipitation amounts were well above normal for the months of May, June, July and August, some months receiving up to three times the normal amounts of rain. The timing of the peak in production was also delayed.

The pollen calendar we created (Table 3) can be a useful tool for pollen forecasting and allergy control. It is now possible to anticipate the start of pollination for the most abundant pollen producers in Lennoxville, and the peak in production for each taxa. However, we have seen that year-to-year variations can be important, and therefore this calendar should be viewed as preliminary work. Numerous years of data are needed to create a valid calendar (Menzel and Fabian, 1999) and pollen data collection will continue. The pollen calendar will therefore be updated in the future.

Continuing pollen monitoring and data collection over many years is justified by the year-to-year variability in climatic conditions, which control the start of pollination. Changes in phenology may also be used to monitor global warming (Menzel and Fabian, 1999; Newham, 1999). Year-to-year variability in the timing of the pollen seasons (either the start or the end) and in the timing of the pollen concentration peaks can easily be detected with this calendar. Continuous monitoring is also relevant in the context of increasing atmospheric CO_2 concentrations, shown to stimulate ragweed's growth and pollen production (Rogers et al., 2006).

Indeed, since global warming could mean warmer spring temperatures, earlier pollination could ensue, as well as longer pollen seasons and greater pollen production (D'Amato et al., 2001). The health impact of pollen could be affected by global warming too, since it could modify plants' geographic distribution, attributes and pollen allergenicity (Beggs, 2004). In Japan, the rise in seasonal allergies is already imputed to climate change (Williams, 2005).

The next step in our research will be to determine the relationship between airborne pollen concentrations and weather parameters. This would improve our ability to improve daily pollen forecasts.

Conclusions

A pollen calendar of the most abundant airborne pollen types has been created for the borough of Lennoxville, Qc. Weather conditions (temperature, snow cover) appear to affect the date at which the pollen season starts for the late-winter/spring pollinators (poplar, birch, maple, oak). Climatic conditions could possibly impact the timing of the peak in pollen production. More data is necessary to confirm these trends statistically. Future work will focus on the relationship between daily weather parameters and the pollen concentrations in order to make daily pollen forecasts for allergy sufferers in the area.

Acknowledgments

The senior author acknowledges funding from Bishop's University Senate Research Committee and the Eastern Townships Resource Centre. James Knudson and Steve Thorneloe made this work possible in 2006. We thank the staff at Buildings and Grounds for providing roof access, as well as the Musée de la Nature et des Sciences de Sherbrooke. We acknowledge thoughtful comments made by two reviewers.

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CROSSING BORDERS: IDENTITY, DIFFERENCE AND COMMUNITY

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Abstract

This article examines the newly-formed Bishop's University Research Cluster "Crossing Borders". As a group of researchers dedicated to the examination of identity and difference, "Crossing Borders" seeks to broaden the scope of academic research on these topics and engage the student and local communities in knowledge creation. Bringing together researchers from eleven disciplines in the Humanities and Social Sciences, this cluster is steeped in interdisciplinary concerns which will allow individual perspectives to enrich common questions and objectives derived from a shared interest in cultural studies. The article frames the theoretical approach to the cluster, its methodologies, and its planned contribution.

Résumé

Cet article brosse un portrait du nouveau groupe de recherche consacré à la thématique des « frontières » basé à l'Université Bishop's. Il s'agit d'un groupe de chercheurs qui se pencheront sur les notions d'identité et de différence dans le but d'élargir la portée de la recherche universitaire sur ce sujet et d'appeler autant les étudiants que la communauté environnante à participer à la création d'une nouvelle base de connaissances. Le groupe de recherche rassemble des chercheurs provenant de plus d'une dizaine de disciplines dans le champ des sciences humaines et sociales. Sa multidisciplinarité permettra aux perspectives individuelles de venir enrichir des questions de recherche et des objectifs communs grâce à un intérêt partagé pour les études culturelles. Cet article présente le cadre théorique du groupe de recherche, ses méthodologies et les contributions prévues par ses membres.

Borders are everywhere. They define the differences between individuals and the world around them, self-identified groups and their social environment, the ambiguous spaces separating genders, sexualities, geographical areas, and ethno-cultural communities. At

Bishop's University we encounter the borders that shape social categories every day in our classrooms and our communities: gay/straight, male/female, French/English, immigrant/Canadian, and so forth. As researchers, many of us investigate specific identities, from ancient female sorcerers and familial belonging to modern immigrant communities and transnational movements, from current indigenous identities to early modern racial differences. As a result, researchers from the humanities and social sciences came together in a research cluster entitled "Crossing Borders." The cluster examines the socially constructed identities delineating nationalities, ethno-linguistic communities, genders and social classes. We are currently engaged in three major research areas: Indigeneity, Gender and Power, and Transnational Identities.

Social categories, be they those we encounter every day or the ones we research, might vary but they persist across space and time, including our immediate communities, as concepts shaping social and cultural interactions. Why is this process a constant feature of social organization? What are the implications of social differentiation? How do various identities intersect with given power structures? How can research on identity make a difference in our communities? And how can insights from students, community activists and citizens who encounter these very issues every day inform these questions? We strongly believe answering broader structural questions requires both an interdisciplinary approach and a focus on knowledge production and sharing at the community level to ultimately aggregate findings and give them wider meaning. This broader knowledge infrastructure aims to strengthen the research process itself and bring together knowledge creators from both the community and the university to make a difference at the local level.

Theoretical Underpinning

The essence of this cluster as a project dedicated to the research of a wide variety of identity and conceptual borders stems from recent theoretical developments. Borders emerged as a popular object of inquiry under the auspices of the borderlands notion. Inspired primarily by research in the American Southwest and Northern Mexico, scholars argued that the borderlands constituted a socially, geographically and politically constructed space across the US-Mexico boundary with distinct characteristics. Mainly, these borderlands were liminal and marginal spaces that not only invited movement across transnational boundaries but also allowed for wide interpretations of cultural identity. Borderlands, in essence, were constituted as spaces where cultures, languages and ethnicities met, converged and negotiated, resulting in specific border identities that borrowed, adapted and transformed cultural and social practices from both sides of the boundary.[1]

Although research on borderlands has largely relied on specific geographic in-between areas where these processes take place, the close connection of borderlands theory to feminist and queer theory has meant that the concept of border has been increasingly applied to cultural and identity differences irrespective of geography or space. Thus, there is greater interest in borders among cultural communities, genders, sexualities, and identities. In this wider sense, borders can also be understood as discursive, conceptual practices that create difference among groups and individuals and therefore shape our daily lives.[2]

When we think of social categories, idealized binary concepts such as male/female, rich/poor, gay/straight, black/white and others come to mind. Even if these categories do not reflect the complexities and ambiguities of daily life, they persist as concepts by which people shape their social worlds. Public discussions readily assume and validate these categories. We need go no further for this persistence of manufactured social categories in public discourse than current Quebec debates on reasonable accommodation of religious and immigrant minorities.

Whereas traditional scholarship assumed intrinsic traits that marked differences among groups, Foucault's idea that juridical systems produce the very subjects they represent, together with Gramscian models of hegemony, meant that social differences and identity came to be seen less as reflections of an essential self than as imposed meanings. Moreover, work on specific contexts has also explored the way daily realities challenged the binary assumptions contained in these discourses.[3]

Increasingly, research has pointed to difference and identity, not only as conceptual categories but as lived experience. Thus, Judith Butler's work on gender has demonstrated how difference is materialized and subverted through repeated body presentations, images, and mannerisms. Philosopher and performance artist Adrian Piper challenges the assumptions of embodied racial identities—how we expect racialized subjects to act in particular ways. Sociologist Nick Crossley examines how learned habits play a central role in the way we conceptualize social categories. Psychologists have recently argued that interpretations of racialized body features seem to partly rely on cognitive learning processes.[4]

But as important as these contributions are in highlighting the instability of categories of identity and the way lived experience can adapt, shift, and even challenge these concepts, they also raise new questions. Specifically, if social categories are inherently unstable and prone to break down as people move through and around them in daily life, then why are they still so successful in defining the terms of reference against which individuals measure themselves and others? In a comparative perspective, why is it that societies across time and space have tended to create systems of social differentiation that often marginalize minorities? Specific categories of identity might come and go, depending on context, but differentiation as a system of social organization remains. Identity categories might change due to local concerns but the notion of difference as a way by which people approach their social interactions remains broadly in place.

Another issue raised by cultural scholarship on social categories refers to the meaning of identity and difference to communities and their goals for social justice. Identity—from individual to collective—can be seen as the effects of hegemonizing discourses that ultimately reflect totalizing categories. However, identity politics have also been understood as useful sites of resistance and mobilization, both at the theoretical and practical levels.[5] Likewise, stemming mostly from feminist and queer theory, scholarship has argued that the celebration of difference, heterogeneity and ambivalence can provide viable means to dissolve rigid categories of identity and thus challenge modernity's totalizing frames of reference. On the other hand, this focus on difference and variability as a critique of identity categories can appear to rob oppressed groups of tools widely applied to effective social mobilization.[6] Ultimately, there is a tension between the theory and the everyday politics of identity.

Tackling these issues requires moving beyond mere academic research and engaging the community in shared knowledge production. After all, questions on the persistence and meaning of social categories reflect back on current concerns we all—academics, activists, students and citizens—share. What are the implications of social categorization? How does the maintenance of identity categories affect social and cultural inequalities? How can these identities, even if originally imposed, be transformed to benefit the disadvantaged? If broad systems of difference are a persistent feature of social organization, no matter the context, what is the appropriate response of those interested in social justice? How will our increasingly globalized world shape the responses to these issues? All these questions point to the relevance issues of difference and identity have to everyday concerns. Even if the jargon of cultural scholarship sometimes seems to occlude rather than bring to light these questions, the importance of how we understand identity speaks to issues people face in their daily lives.

Bridging these theoretical questions on identity with everyday concerns and experiences is essential to transforming academic research into cooperative knowledge production and dissemination that impacts our local communities. Recent trends have increasingly highlighted the importance of knowledge networks that bring together academics, community activists and students. Not only have community-based research initiatives and public knowledge production gained much impetus in the last decade, but such ventures and partnerships are increasingly incorporating fields and research from the humanities as well, as can be seen by the Research Impact project on knowledge mobilization through a partnership between various Canadian universities.[7]

Methodology

For the members of the Crossing Borders cluster, stretching the traditional boundaries of research and engaging the community in knowledge production is essential to the success of our examination of identity and difference. Not only can such a process open scholarship to the broad public and help to impact our communities, but this dialogue with the community can also reflect back on our own research, enrich it and provide us with new perspectives of inquiry.

Certainly many challenges exist to such a process. Translating academic work produced in the context of very specific disciplinary literature and concepts requires new forms of organizing, producing and disseminating knowledge. Academics may have thoroughly incorporated the linguistic turn and its emphasis on the ambiguous and constructed nature of categories, but many of our students, families and friends whom we want to engage still reflexively approach identity in an essentialist fashion.

These divides can seem difficult to bridge productively. As researchers who have mostly come of age in traditional academic settings, the walls of the ivory tower offer comfort. But the practice of academic research as we know it presents unsustainable contradictions in the face of the poststructuralist shifts we have all witnessed and incorporated. We tend to create knowledge within an academic system that still largely operates within disciplinary boxes and through concepts somewhat removed from every day experiences. Yet, if there is anything that we have learned from the rapid theoretical shifts of the last thirty years it is that, as researchers, we are situated in the world. Our research is informed, even implicitly, by the cultural, political and social trends we live and breathe, just as do our students and our friends in local communities. Acknowledging the commonality of our experiences and how these contingencies affect us all means that we must approach knowledge production and dissemination as part of broader objectives we share with those around us and beyond the academe. Doing so will require creating infrastructures for knowledge production that do not just privilege ivory tower concerns and concepts, but rather emphasize dialogue and interaction from a variety of perspectives.

The cluster is divided into three axes: Indigeneity, Gender and Power, and Transnational Identities. The first axis, **Indigeneity**, explores the boundaries and their transcendence between Indigenous Peoples and the larger societies in which they find themselves. In terms of members' contributions, Jean Manore (History) examines the administrative and legal borderlands that Aboriginal Peoples must navigate as they negotiate Euro-Canadian understandings of identity, citizenship, rights, and culture. Christopher Stonebanks (Education) analyses indigenous issues from an international perspective, including research from North America to the Middle East. From a critical pedagogy perspective, formal and non-formal locations of education are examined to reveal the formation of identity, ways of knowing and cultural interpretations in the unequal and ongoing framework of colonialism. Mary Ellen Donnan (Sociology) addresses the diversity of homeless people in Canada's centers. Credentials of recent immigrants to Canada are interpreted in a series of regulatory and social processes that create barriers to income. The bordering of indigenous peoples' identities into categories such as "Status and Non-Status Indian" creates a maze of regulation and disentitlement directly relevant to these individuals' opportunities to access affordable housing.

The second axis, **Gender and Power**, explores how gender categories shape lived experiences in power-laden contexts, from criminality and deviance to political discourses and individuality. Members' research includes the following: Cristian Berco (History) examines the construction of gendered deviance through early modern Spanish sources on sodomy, female sorcery, and venereal disease. Sophie Boyer (German) explores the meeting points of crime and sexuality in Weimar Germany literature, especially the representation of criminal behaviour and the gendered boundaries separating the "normal" from the "deviant". Claude Lacroix (Art History) examines representations of the human body as sites of mimicry, resistance or challenge to the mainstream/normative social construction in categories of gender identities. Linda Morra (English) examines how evolving national imaginings influenced Canadian women writers. At the turn of the 20th century, some women writers expressed delight in sublimation into a transcendent idea of citizenship. While such views gained them literary legitimacy, they paradoxically relinquished the very autonomous identity they had sought. Michele Murray (Religion) investigates how labelling women "magicians" in the late antique Jewish and Christian communities was a discursive strategy by those in power to construct social boundaries, gender roles and authority structures. Jessica Riddell (English) examines the representational strategies within innovative genres commissioned by Queen Elizabeth I and her male courtiers and how they served to contest and re-form gender categories.

The third axis, **Transnational Identities**, investigates the constitution, the politics and the representation of communal and individual identities in a transnational context, specifically through discourses that draw on dynamic relations across borders, ethnicities and races. Regarding members' research, Gordon Barker (History) investigates the shifting identities and geographical movements across national borders of American free blacks and slaves, including how the white community viewed these crossings as dangerous, disorderly, and disruptive. Claude Charpentier and Dale Stout (Psychology) analyze the underlying psychological factors shaping Quebecers' attitudes toward ethnic and religious groups, specifically how socially constructed notions of cultural vulnerability and identity play out in shaping the differing attitudes of Estrie Anglophones and Francophones toward immigrants. Cristiana Furlan (Italian) examines travel literature as a primary means for the representation of "Self" and "Otherness," particularly as encounters with new and different cultures are key to understanding how borders function and identity is formed. Louis-Georges Harvey (History) investigates identity within political discourse, especially in terms of changing identities within French Canadian and Anglophone 19th century communities. Catherine Tracy (Classics) examines Ancient Romans' understandings of legal personhood which shed light on their concepts of biological relationships and the construction of kinship related to imperialism. Jordan Tronsgard (Spanish) explores dynamic and heterogeneous emerging Spanish identities in works of narrative fiction and film, especially how collective historical memory relates to the less "traditional" and more transnational realities of Spain today. Trygve Ugland (Political Studies) focuses on the fields of Comparative Politics and Comparative Public Policy, with an emphasis on European and Scandinavian Politics, as well as on the relationship between Canada and Europe.

These axes provide a conceptual umbrella under which members' ongoing research programs, normally bound within specific disciplinary concerns, can contribute to an interdisciplinary dialogue regarding social differentiation, its persistence and meaning. As such, individual members' work is complementary and additive in scope, bringing together their findings from a variety of contexts and disciplines to answer broad structural and theoretical concerns regarding identity and difference.

Stretching the boundaries of individual research from the specifically disciplinary, with its own literature and concerns, to the broadly structural will require an infrastructure to facilitate this dialogue. As we obtain funding, the researchers affiliated to the different axes will hire research assistants to help members review both the common and individual literature and shape broad group approaches related to the meaning of social differentiation. At the same time, opportunities for research sharing and dialogue will be essential to creating the necessary interdisciplinary synergies. As such, axes will continue with the informal gatherings we have termed the "Friday brownbag series" already started in 2010, whereby members present findings, questions, issues of concern stemming from their research to the group at large. So far, these have been tremendously helpful in revealing the common interests we share across disciplinary boundaries. Likewise, more formal meetings in the shape of colloquia, seminars and lectures that will include invited speakers will also form a regular part of each axis' work. Not only will each member's scholarship contribute to the issues examined within individual axes but the broader structural and interdisciplinary perspectives required will allow researchers to examine their own work from a different point of view.

At the same time, public colloquia, seminars, and lectures will present one of many opportunities to start engaging the community in this work. As mentioned before, this process will be essential in creating the necessary knowledge infrastructure and multivalent processes to more effectively give the community a stake and a sense of ownership in this task while also helping academic researchers to stretch the normal boundaries of their work and recognize how their situatedness affects the questions they ask, the answers they seek, and how they understand their contribution to the here and now. As such, each axis will put in place a specific process of consultation with community activists, student groups and citizens around the issues defining their inquiries. One of the best tools for doing so will be small "unconferences" which will allow participants from every walk of life to break away and discuss issues of common concern in a non-hierarchical, less formally structured sense. Thus, rather than privileging academic researchers as imparters of truth, these "unconferences" can bring together more broadly understood knowledge creators to bear on these questions. Likewise, public roundtables on identity and difference bringing together not only academic researchers but student activists, artists, and community members can help to provide a forum for the sharing of concerns and knowledge while allowing team members to view their own interests in a broader, more immediate perspective. Finally innovative events stemming from curatorial and public scholarship techniques such as a Living Books series, or the use of digital and web media to allow for broad-based knowledge creators (citizens, students, academics) to work collaboratively in the design and implementation of projects that combine broad findings on the meaning of identity and difference with community-engaged projects can help to transform traditional, ivory tower 'research' into broad-based civic engagement.

For instance, we are planning an interdisciplinary symposium on the human body to be held in 2012 together with the Montreal Dance Company *Van Grimde Corps Secrets*. This symposium will address issues around the body that reflect current concerns—from the way body scripts, such as appearance, mannerisms and dress, are read socially to technological and medical changes and the questions they raise about body modification and ownership. The meeting will bring together not only academic researchers but artists as well in order to start addressing these questions in a manner that reaches out to a broader public. Not only will the symposium therefore include public debates to be conducted together with interested students, it will also culminate in an exhibit that will bring together dance performances, art work and scholarly texts through an innovative architectural display that will begin in May 2012 in Montreal at the Festival Transamerique. The exhibit will then travel throughout Canada and Europe to return to Bishop's University in 2013.

The last plank for community engagement focuses on students. Funds are already dedicated to our Malawi Project inviting Bishop's students to participate in research-based experiential learning in Malawi, Africa. While living in the rural village of Makupo, students from multidisciplinary backgrounds engage in creating and exploring their own research interests in conjunction with professors, peers and members of the local community. The five-week experience is meant to encourage students to creatively expand their learning through a spirit of reciprocal participation and dialogue.

Ultimately, we believe the combination of interdisciplinary research and community-based knowledge production and sharing will allow the team to more fruitfully engage broad questions around the persistence and meaning of identity and social differentiation while making a positive contribution to our immediate communities. For work on questions shaped by cultural studies to succeed and for university communities to remain viable in the long term, a more rigorous engagement with the community that gives everyday citizens a sense of common ownership in the campus and its work is essential.

Importance and Contribution

Our rapidly globalizing world brings both exhilarating possibilities and daunting challenges. We face shrinking communication, media and economic borders which promise a global village but can also solidify existing inequalities. We face mass movements of transnational migration across national boundaries that, in many cases, are becoming increasingly militarized. We face, especially in Canada, a multicultural, multi-border society where a common civic consciousness is built on a tenuous balance with the differences enshrined in individual identities driven by cultural, ethnic, gender and class politics.

By taking a broad view of border as concept, reality and metaphor, the Crossing Borders cluster brings together researchers working on the great variety of identities we encounter to examine their meaning, function and relevance to our local, regional and international communities. The cluster's originality stems from its willingness to consider the concept and reality of borders in the broadest sense. As discussed above, the continuing influence of queer and feminist theory has meant that we can not only refer to borders in the strict geographical sense that originally informed the concept of the borderland, we can also consider borders as discursive practices that create identity differences among groups of people, be it through gender, ethnicity, language or culture.

This broad understanding of borders allows the cluster to bring together researchers working on very specific identities, often separated by time, space and even type, yet sharing a conceptual framework. Thus, we have members examining the border of indigeneity, an identity that is malleable as it both depends on a geographical perspective but can cut across national boundaries. We also have researchers focusing on the all-too-common double border of gender and deviance that keeps appearing across societies and that interlink them as part of broader patriarchal projects. We have individuals working on familial, civic and socio-religious borders in the ancient world, national ones in Europe, political and linguistic ones in Québec, and even the US-Canada border and the movements of peoples and ideas across it. In short, various research projects that normally fall under specific academic categories and respond to a particular subject literature are being brought together through the broad conceptualization of borders to help, through these disparate perspectives, in understanding how borders shape our world.

Ultimately it is the ubiquity of borders that makes this research enticing and relevant to local, national, and international concerns. Moreover, it is because identity boundaries affect all of us, especially in today's globalizing world, that the cluster considers its mission of community outreach and dissemination of its research beyond the hallowed halls of academia as essential. "Crossing Borders" not only asks that we consider borders more broadly but that, as researchers, we stretch our very specialized work and enter a dialogue with the communities we serve.

ENDNOTES

1 The term borderlands was first popularized by Herbert E. Bolton, *The Spanish Borderlands: A Chronicle of Old Florida and the Southwest*, Foreword Albert L. Hurtado (1st ed., 1921; Albuquerque: University of New Mexico Press, 1996). Important historical studies on the southwest border include Sherburne F. Cook, *The Conflict Between the California Indians and White Civilization* (1st ed., 1943–1946; Berkeley: University of California Press, 1976), David Hurst Thomas, ed., *Spanish Borderlands Sourcebook*, 27 vols. (New York: Garland, 1991); David Hurst Thomas, *Columbian Consequences, Volume 2: Archaeological and Historical Perspectives on the Spanish Borderlands East (Washington DC, Smithsonian Institution Press, 1990)* and Cynthia Radding, *Wandering Peoples: Colonialism, Ethnic Spaces and Ecological Frontiers in Northwestern Mexico, 1700–1850* (Durham: Duke University Press, 1997). However, both geographers and anthropologists have also examined borders more widely around the world as areas of cultural negotiation and exchange. See, for example, *Alan G. Ogilvie, Europe and its Borderlands (London: Thomas Nelson, 1957);* P. Bohannan and F. Plog, eds. *Beyond the Frontier: Social Process and Cultural Change* (New York: The Natural History Press, 1967); Wendy James, *'Kwanim pa: The Making of the Uduk People: An Ethnographic Study of Survival in the Sudan-Ethiopian Borderlands* (Oxford: Clarendon Press, 1979); Aletta Biersack, *Papuan Borderlands: Huli, Duna, and Ipili Perspectives on the Papua New Guinea Highlands* (Ann Arbor: University of Michigan Press, 1995).

2 Gloria Anzaldúa, *Borderlands: The New Mestiza* (San Francisco: Spinsters, 1987) was extremely influential in addressing chicana borderland identities in the context of cultural hybridity. Approaching identity as a contested border from a tradition of feminist literature, Anzaldúa's ground-breaking poetry opened up the study of borders as discursive categories. Influenced by Queer theory's concept of difference and traditions in feminist theory, much recent work has focused on the cultural borders of gender, race, and identity. See A. Keating, *Entre mundos/ Among Worlds: New Perspectives on Gloria E. Anzaldúa* (New York: Palgrave, 2005); S. Oboler, *Ethnic Labels, Latino Lives: Identity and the Politics of (re) Presentation in the United States* (Minneapolis: University of Minnesota Press, 1995); M. P. Root, *The Multiracial Experience: Racial Borders as the new Frontier* (Thousand Oaks, CA: Sage, 1996); George J. Sánchez, *Becoming Mexican-American: Ethnicity, Culture and Identity in Chicano Los Angeles, 1900–1945* (New York: Oxford University Press, 1993); David Blake Willis and Stephen Murphy Shigematsu, eds., *Transcultural Japan. At the Borderlands of Race, Gender, and Identity* (New York: Routledge, 2008).

3 On the construction of difference, especially via judicial processes, see Michel Foucault, "Right of Death and Power Over Life," in *The History of Sexuality* (New York, 1980), Vol. 1. The idea that categories of identity are constructed through binary oppositions has been applied in a variety of fields and encompasses a vast scholarship. In the area of postcolonial studies, see Edward Said's seminal *Orientalism* (London, 1978) and, especially, Homi Bhabha, "DissemiNation: Time, Narrative, and the Margins of the Modern Nation," in H. Bhabha, ed. *Nation and Narration* (London, 1990), 291–322 for an exploration of both the construction of postcolonial identities and ambivalence as a tool to combat dominant discourses. Likewise, Benedict Anderson's *Imagined Communities: Reflections on the Origins and Spread of Nationalism* (London, 1983) explored the construction of national identities. Later examinations on the issue include Doris Summer, *Foundational Fictions: The National Romances of Latin America* (Berkeley, 1983) and Zoe Bray, *Living Boundaries: Frontiers and Identity in the Basque Country* (Brussels, 2004). On the construction of race and its nuances see Patricia Hill Collins, *Black Feminist Thought: Knowledge, Consciousness, and the Politics of Empowerment* (New York, 2000); Michèle Lamont, *The Dignity of Working Men: Morality and the Boundaries of Race, Class, and Immigration* (Cambridge, MA, 2000); and Ron Eyerman, "Cultural Trauma: Slavery and the Formation of African American Identity," in J.C. Alexander et al. *Cultural Trauma and Collective Identity* (Berkeley, 2004). In the field of gender and queer studies see Mark D. Jordan, *The Invention of Sodomy in Christian Theology* (Chicago, 1997), Randolph Trumbach, *Sex and the Gender Revolution* (Chicago, 1998); David Halperin, *One Hundred Years of Homosexuality: And Other Essays on Greek Love* (New York and London 1990); Elizabeth Armstrong, *Forging Gay Identities: Organizing Sexuality in San Francisco, 1950–1994* (Chicago, 2002). These are but some examples of the way identity construction has shaped scholarship across fields.

4 Judith Butler, *Gender Trouble* (New York, 1990); Judith Butler, *Bodies that Matter* (New York, 1993); Adrian Piper, "Passing for White, Passing for Black," *Transition* 58 (1992): 4–32; Nick Crossley, *The Social Body* (London, 2001); Jamin Halberstadt, Steven J. Sherman and Jeffrey W. Sherman, "Why Barack Obama is Black: A Cognitive Account of Hypodescent," *Psychological Science* 22 (January 2011): 34–38.

5 For a recent application of both Foucault's concepts of disciplining and control as well as Gramsci's model of hegemony see T. K. Vinod Kumar and Arvind Verma, "Hegemony, Discipline and Control in the Administration of Police in Colonial India," *Asian Journal of Criminology* 4, no. 1 (June 2009): 61–78. On the way nuanced identities can be transformed as spaces of resistance see, for instance, work on youth subcultures in Andy Bennett and Richard Peterson,

eds. *Music Scenes: Local, Translocal, and Virtual* (Nashville, 2004), or Manuel Castells, *The Information Age: Economy, Society and Culture . Vol. 2: The Power of Identity* (Oxford, 2000) for mobilization in networked societies. Also consider identity formation via dress as an act of resistance as argued in Berrin Koyuncu Lorasdagi, "The Headscarf and Resistance Identity Building: A Case Study on Headscarf Wearing in Amsterdam," *Women's Studies International Forum* 32, no. 6 (Nov–Dec 2009): 453–62.

6 On difference and ambiguity as a challenge to heteronormativity see classics such as Butler, *Gender Trouble;* Eve Kosofsky Sedgwick, *Epistemology of the Closet* (Berkeley, 1990); Steven Seidman, *Difference Troubles* (Cambridge, 1997). Examples of applied work include Josiah Blackmore and Robert S. Hutcheson, *Queer Iberia: Sexualities, Cultures, and Crossings from the Middle Ages to the Renaissance* (Durham, 1999); Robyn Wiegman, "Interchanges: Heteronormativity and the Desire for Gender," *Feminist Theory* 7, no. 1 (2006): 89–103. For a re-evaluation of the usefulness of this model for political mobilization see the forthcoming volume of essays, María do Mar Castro Varela et al, eds. *Hegemony and Heteronormativity: Revisiting 'The Political' in Queer Politics* (London, 2011). For a clear overview of the complex relationship between determinism and agency in the work of Foucault as well as recent feminist critiques of his positions, particularly in terms of the body, see Margaret A. McLaren, *Feminism, Foucault, and Embodied Subjectivity* (Albany, 2002), ch. 3. For a pointed critique of whether Foucault's ideas about power leave any room for effective resistance see Nancy Fraser, *Unruly Practices: power, discourse and gender in contemporary social theory*, Cambridge, 1989), p. 29 as well as Nancy Hartsock, "Foucault on power: a theory for women?" in L. Nicholson, ed., *Feminism/Postmodernism* (London & New York, 1990), p. 164.

7 Examples of calls for a renewal of public scholarship and community-based research as part of broad university practices include Lakshman Yapa, "Public Scholarship in the Postmodern University," *New Directions for Teaching and Learning* 105 (2006): 73–83; Derek Barker, "The Scholarship of Engagement: A Taxonomy of Five Emerging Practices," *Journal of Higher Education Outreach and Engagement* 9, no. 2 (2004): 123–37; Kerry Strand, et al. *Community-Based Research and Higher Education: Principles and Practices* (San Francisco, 2003); Ray Barnhardt, "Indigenous Knowledge Systems and Alaska Native Ways of Knowing," *Anthropology and Education Quarterly* 36, no. 1 (2005): 8–23. The Research Impact project was created in 2006 through a grant for the creation of Knowledge Mobilization Units in York University and the University of Victoria. In 2010, University of Saskatchewan, UQAM, and the Harris Centre at Memorial University joined the network (http://www.researchimpact.ca).

PSYCHOLOGICAL HEALTH AND WELL-BEING: A RESEARCH AGENDA FOR THE EASTERN TOWNSHIPS

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Abstract
Well-being is an important concept that has received increasing research attention in recent years. A related concept, psychological health and well-being, introduces the notion that mental health is a key aspect of well-being. Following a review of current conceptualizations of well-being and their links to psychological well-being, this paper presents current evidence documenting how well-being is associated with important outcomes across a variety of life domains, including work, social and community life, and health. Planned and ongoing research conducted by members of the Psychological Health and Well-being research cluster at Bishop's University is then briefly summarized and its importance for the people and communities of the Eastern Townships is highlighted.

Résumé
Le bien-être est un concept important qui attire de plus en plus l'attention des chercheurs. La santé mentale et le bien-être, un concept qui lui est apparenté, permet d'affirmer que la santé mentale joue un rôle clé dans la présence d'un sentiment de bien-être. À la suite d'un survol des conceptualisations actuelles du bien-être et des liens qu'elles entretiennent avec le bien-être psychologique, cet article rendra compte des différents projets de recherche en cours qui documentent la façon dont le bien-être est intimement lié aux issues d'une variété d'aspects de la vie, notamment la vie professionnelle, sociale et communautaire ainsi que la santé. Nous brosserons ensuite un portrait sommaire des projets de recherche en cours ou prévus dirigés par les membres du groupe de recherche sur la Santé mentale et le bien-être, basé à l'Université Bishop's. Enfin, l'impact de ces projets de recherche sur la communauté des Cantons-de-l'Est sera brièvement décrit.

Whether conceived of as a momentary state or as an ongoing process of growth and adaptation to changing life circumstances, well-being has become the focus of much research in recent years. Quality of life, wellness, happiness, and thriving are related terms used by researchers that similarly convey the notion of experiencing life as something positive and satisfying. The term psychological health and well-being further delineates this idea by suggesting that psychological health is central to the experience of well-being.

In 2009, Bishop's University identified psychological health and well-being as one its four strategic research areas. This particular research focuses on finding ways to improve the health and well-being of individuals and communities. The Psychological Health and Well-being Research Cluster is a research group formed of members from the fields of Social Sciences, Humanities, Natural Sciences, and Business whose activities are aligned with this aim. Their overall objective is to produce knowledge regarding how people and groups within the community can pursue their goals in ways that support health and well-being, and to identify the tools that will help them achieve this.

As the recently appointed Tier II Canada Research Chair in Health and Well-being for the Psychological Health and Well-being research cluster at Bishop's University, it is my pleasure to have this opportunity to present and discuss this important topic. In this paper I will outline current conceptualizations of psychological health and well-being, and discuss the reasons why it is an important goal for both individuals and communities. More specifically, I will discuss the possible ways that the recently created Psychological Health and Well-being Research cluster at Bishop's University proposes to study the means to ensure that the people of the Eastern Townships thrive and remain healthy and vibrant.

Conceptualizing Well-being

Although the term "well-being" is purported to date back to the early 1600's (Online Etymology Dictionary), it is only in recent years that the concept of well-being has become ubiquitous within the research literature. This may be due in part to its connections with health and health-care as a desirable outcome of treatment interventions for mental and physical health issues. Indeed, a survey of the scholarly health-related research literature demonstrates this popularity with almost 475,000 citations indexed by this term in the past 5 years alone. The term well-being is, however, also used widely outside of health contexts to describe the overall quality of life experienced by both individuals and communities with respect to their emotional, social, and financial status. Whether used in a specific or general context, researchers generally agree that well-being refers to a subjective state characterized by a predominance of positive feelings.

Early conceptualizations of well-being were focused on the absence of distress (McDowell, 2010), whereas recent views have shifted to a more comprehensive focus on the positive characteristics and strategies involved in the development and experience of well-being. Fuelled by the growing interest in positive psychology—a sub-discipline that concentrates on understanding human flourishing and growth—scholars in Psychology have proposed several detailed but divergent models of well-being. These different conceptualizations can be viewed as falling into one of two competing camps. The first camp views well-being from a hedonistic perspective, focusing primarily on the role of positive and negative feelings in the experience of well-being. The second camp approaches well-being from a dynamic eudaimonic perspective, rejecting the notion that positive feelings alone indicate well-being and focusing instead on the active, growth-related aspects of well-being (Waterman, 1993).

From the hedonic tradition, well-being is closely aligned with the ancient Greek Epicurean conceptions of the purpose in life and the nature of living the "Good Life" (Waterman, 1993, 2008). The ultimate goal in life, from the view of the hedonist, is to maximize pleasure—"hedonia"—and minimize pain. Accordingly, achieving hedonia becomes the ultimate purpose in life, regardless of how feelings of pleasure are achieved. One model that views well-being from this hedonic perspective proposes that well-being is comprised of two general components: an emotional component characterized by high levels of positive feelings and low levels of negative feelings, and an evaluative component that includes overall satisfaction with one's life and satisfaction with specific and important life domains such as work, personal life, family life, etc. (Ryan & Deci, 2001). Because evaluation of both of these components is completely subjective, some researchers have adopted the term "subjective well-being" to describe this particular hedonic view (Diener, 1984; Diener, Suh, Lucas & Smith, 1999). Consider the following two examples that illustrate the hedonic view of well-being. An individual who has a modest standard of living that meets basic needs but who values and enjoys connections with a large extended family rates subjective well-being as relatively high because of the pleasure obtained from regular and meaningful contact with her or his family-based social network. Contrast this to someone who is the CEO of a large corporation and who enjoys a standard of living that most people can only dream of, but who has few if any social contacts with whom he or she can share his or her successes. If this CEO values having a successful career, a solitary lifestyle and enjoying the finer pleasures in life that only money can buy then he or she may also rate his or her subjective well-being at the same level as the person with only modest means who has many social contacts. These examples highlight one of the major criticisms of this hedonic model of well-being, namely that it provides a descriptive account of well-being without identifying the sources of well-being or explaining why individuals experience different levels of well-being.

An alternative and rivalling view of well-being, the eudaimonic perspective, also has its roots in classical Greek teachings. However, this eudaimonic approach favours the ethics of Aristotle over those of his pleasure-seeking contemporaries. Rather than the pursuit of pleasure, the eudaimonic view proposes that well-being arises when one pursues goals that are aligned with the authentic self, or *daimon*. Indeed Aristotle, in his *Nicomachean Ethos* (Trans. T. Irwin, 1985), proposed that eudaimonia was not a subjective but in fact an objective state that derived from contemplating the best within oneself and personal excellence (Waterman, 2008). Modern scholars who subscribe to this particular view of well-being take this one step further by focusing on how one might not just contemplate but also act upon these personal contemplations. From this view, then, well-being is an emergent property of engaging in pursuits that lead to personal growth and that develop one's potential. Rather than focusing on achieving end states of satisfaction and positive feelings, in other words happiness, the eudaimonic approach to well-being is dynamic and process-focused and highlights the importance of being engaged in meaningful goals in life for enhancing well-being. In short, its focus is more on the process of flourishing rather than simply feeling good.

One popular model of well-being founded on this eudaimonic perspective is that of *psychological well-being* proposed by Ryff and colleagues (1989; Ryff & Keyes, 1995). Psychological well-being is proposed to be a state of optimal psychological functioning comprised of multiple dynamic dimensions. The six core dimensions suggested to be essential for optimizing quality of life are 1) self-acceptance, 2) autonomy, 3) environmental mastery, 4) personal growth, 5) purpose in life, and 6) positive relations with others. The latter three dimensions in particular are deemed to capture the essence of eudaimonic well-being as being dynamic and action-oriented by focusing on purposefully pursuing personally meaningful goals and cultivating rewarding relationships. Although this newer view of well-being has now been around for two decades, research has predominately focused on hedonic models of well-being. It is only very recently that researchers have begun to integrate the two theoretical traditions (Keyes, 2006).

Apart from the subjective/objective distinction, hedonic and eudaimonic perspectives of well-being also differ with respect to their capacity to explain why someone may or may not be experiencing a certain level of well-being. Recall the example given earlier contrasting two individuals with very different life circumstances who nonetheless might report experiencing high levels of well-being. From the hedonic perspective, both individuals experience positive feelings and satisfaction with their life circumstances and are therefore happy. But the reasons *why* they have positive feelings and satisfaction are not further explained apart from identifying that they both experience positive feelings and life satisfaction. From the eudaimonic perspective, having many rewarding friendships and family relationships contributes to the well-being of the individual living by modest means, whereas being engaged in a meaningful and purposeful career similarly enhances the well-being of the second individual. Although both perspectives have merit, the eudaimonic perspective offers a more comprehensive theoretical view of the components of well-being which is essential in order to advance our understanding of how people can enhance their quality of life.

To summarize, research on well-being has distinguished two traditions based on early Greek writings on how to live the Good Life: 1) hedonic well-being, which focuses on feelings of pleasure and satisfaction and which can be thought of as *emotional well-being* (Keyes, 2007), and 2) eudaimonic well-being, which embodies the notion of personal growth and realizing one's potential as being essential to living the Good Life. Although the hedonic approach has tended to dominate research on well-being, eudaimonic perspectives are receiving increasing attention (see Deci & Ryan, 2008 for an overview) as they provide a comprehensive view of how and why people may experience different levels of well-being, as well as how life goals may play a role in the development of well-being. Nonetheless, there is considerable overlap between the two: fulfilling one's potential may indeed lead to increased feelings of happiness, making it more likely and practical to think of each type of well-being as running in tandem with one another (Biswas-Diener, Kashdan & King, 2009; Kashdan, Biswas-Diener & King, 2008), rather than being truly separate and distinct.

Psychological Health and Well-being

A concept related to well-being, psychological health is currently defined as including more than just the absence of mental illness. This term embodies the notion of health that was first redefined by the World Health Organization in 1948 to mean "a complete state of physical, mental, and social well-being and not merely the absence of disease or infirmity" (World Health Organization, 2002). In Canada, the term health is often viewed from a public health promotion perspective which conceptualizes health as "the capacity of people to adapt to, respond to, or control life's challenges and changes" (Frankish, Green, Ratner, Chomik & Larsen, 1996). Implicit within this conceptualization is the idea that self-regulation—the ability to control and regulate one's actions—is central to how people improve, maintain and manage their health and well-being. We will return to a discussion of the role of self-regulation for health and well-being later in this paper.

Psychological health is often seen as synonymous with mental health, a term that was initially defined in terms of the absence of depression and anxiety and other psychopathological states (Westerhof & Keyes, 2010). However, much like the way we currently view "health," both mental health and psychological health are now more routinely taken to imply positive states of psychological functioning rather than the absence of mental illness or disorder. Keyes (2007) further proposes a eudaimonic view of mental health, suggesting that it should be viewed as flourishing because "the absence of mental illness is not the presence of mental health" (Keyes, 2007, 95). In keeping with this view, the recent World Health Organization (2005) definition of mental health as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" reflects this shift in understanding the determinants and necessary conditions of mental health. In fact the WHO (2005) has identified three core components of mental health within this definition: (1) well-being, (2) effective functioning of an individual, and (3) effective functioning for a community. Beyond stipulating that mental health includes well-being, this perspective proposes that not only effective individual functioning but also community functioning are essential for mental or psychological health. The implications of this particular view will be discussed further in this paper as we explore what psychological health and well-being may mean for the people and communities of the Eastern Townships.

As can be seen from the above discussion, the concept of mental or psychological health embodies several of the key aspects of well-being as defined by the two prevailing well-being traditions. Emotional or hedonic well-being is perhaps best reflected by the first component, whereas the core elements of eudaimonic well-being are captured by the second, that is, the notion that realizing one's potential and functioning effectively in the world is key to the experience of well-being. Given the conceptual overlap among the terms mental or psychological health and well-being, using the term psychological well-being seems an appropriate way to capture the essence of both these components which of course are inextricably linked.

Why is 'Psychological Health and Well-being' worth studying?

The previous discussion focused on unpacking the term psychological health and well-being while emphasizing the distinctions among the two prevailing traditions that have been applied when studying well-being in general. Although it is clear that well-being, and especially psychological health and well-being, is much more than simply "happiness," the question remains as to why we need to study well-being at all. What can be gained by researching psychological well-being, its antecedents, correlates and consequences? In this next section, I will argue that a research program focused on improving our understanding of the development and sustainment of psychological health and well-being is both necessary and important for individuals and communities, and that psychological health and well-being is, as some researchers have suggested, functional beyond just "feeling good" when things go well (Oishi, Diener & Lucas, 2007). To ignore this important aspect of life in favour of apparently more concrete or practical concerns is ostensibly short-sighted and problematic for a variety of reasons.

First, we will consider the research that has identified some of the consequences of having high and low levels of psychological well-being. Apart from experiencing higher levels of positive affect or "happiness," people with high levels of psychological well-being tend to do better in life. That is, well-being is not just a potential outcome of life going well, but when achieved can be a precursor of many important outcomes we associate with life going well. For example, a recent review of over 200 papers found that compared to people low in well-being, people with high levels of well-being or "happiness" fared better in important life domains such as work, social and community life, and health (Lyubomirsky, King & Diener, 2005). People with high well-being are more likely to graduate from college and then secure better jobs (Lyubomirsky et al., 2005). They hold more prestigious jobs (Roberts, Caspi & Moffitt, 2003), are viewed more positively by their supervisors (Cropanzano & Wright, 1999), and even make more money (Lyubomirsky et al., 2005). They are also more productive, have lower levels of absenteeism, and are conscientious employees (Lyubomirsky et al., 2005).

In the social and community domain, having high levels of happiness is linked to a greater likelihood of being married (Lucas, Clark, Georgellis & Diener, 2003) and being satisfied with marriage afterwards

(Lyubomirsky et al., 2005). Higher levels of well-being are also linked to greater community involvement and volunteering (Lyubomirsky et al., 2005; Oishi et al., 2007). One reason for these observed social benefits is that people who experience high levels of well-being are known to exhibit adaptive social behaviors such as being more socially expressive and having better social skills in general (Nave, Sherman & Funder, 2008).

With respect to health, higher levels of well-being or happiness are linked to several important outcomes. Although there is extensive research supporting a link between well-being and self-reported health (Lyubomirsky et al., 2005), it is only recently that researchers have been examining the links with more objective, direct evidence of health-related outcomes. For example, one review of over 35 studies found that positive psychological well-being predicts lower subsequent mortality among healthy individuals (Chida & Steptoe, 2008). To the extent that they express positive affect and humour, people with higher levels of well-being may even live longer (Pressman & Cohen, 2007). Well-being can be especially beneficial for those who are already at risk for disease. People with high levels of well-being generally show better prognosis for their health conditions than do people who are anxious or depressed (Pressman & Cohen, 2005; Strine et al., 2008). Psychological well-being also predicts lower mortality for patients with HIV/AIDS and renal failure (Chida & Steptoe, 2008). In one recent study, higher levels of well-being reversed the usual negative effects of low education levels on markers of inflammatory processes (Adler & Rehkopf, 2008), such that low education was associated with less risk for inflammation, but only among those with higher levels of psychological well-being (Ryff, 2010). This finding is especially important given the known links between inflammation and a variety of chronic health conditions including osteoporosis, arthritis, cardiovascular disease and Alzheimer's disease (Ershler & Keller, 2000), and the expected rise in prevalence of these diseases with the greying of the nation in the coming years.

At first it may appear that the links between well-being and favourable life outcomes are somewhat circular, in that the outcomes linked to well-being could easily be viewed as the precursors of well-being. Consider though that the review of the literature by Lyubomirsky and colleagues (2005) not only found correlational associations between well-being and potential outcomes from cross-sectional studies, but they also reported the same findings for longitudinal studies where well-being at Time 1 was linked to outcomes at Time 2, and for experimental studies where well-being was shown to have positive effects on a variety of outcomes under controlled conditions (Lyubomirsky et al., 2005).

Understanding how to enhance and sustain psychological well-being can have some very valuable consequences. It may increase work productivity, as well as enhance financial security for individuals and their families. It can enhance relationship functioning and marital stability for those inclined to find a life partner. Maximizing well-being on the individual level can also have benefits at the community level by increasing community engagement via increased volunteering activity. With respect to health, psychological well-being may serve as a protective buffer against the situational health risks for chronic disease conferred by having a lower level of education, and even increase longevity among both currently healthy individuals and patients with existing health conditions. Given the aging population and the expected increasing demands on the health-care system in the coming years, helping people live healthier, happier lives by increasing and supporting their well-being will be valuable both practically and on the level of quality of life. Although these are just some of the many benefits of well-being that researchers have uncovered to date, clearly they are important and suggest that a better understanding of the ways to increase well-being is a worthy pursuit for both individuals and their communities.

Psychological Health and Well-being research and the people and communities of the Eastern Townships

In this next section I will review some of the key research themes centered on well-being that have been identified by the Psychological Health and Well-being Research Cluster at Bishop's University. I will then briefly discuss their relevance for the people and communities of the Eastern Townships.

The research themes of the Psychological Health and Well-being cluster focus on understanding and enhancing health and well-being across a variety of diverse settings and issues. Six core themes have been identified which form the basis of the corresponding cluster research groups: 1) Self-perceptions, self-regulation, health, and well-being, 2) Chronic illness and pain management, 3) Occupational well-being, 4) Use of health services, 5) Stress, health, and well-being, and 6) Promoting well-being. Table 1 presents these themes along with the sub-themes and examples of ongoing and planned research projects from members of the cluster which will be described in greater detail in the following sections.

Self-perceptions, self-regulation, health and well-being. The first theme addresses the role of self-perceptions and self-regulation in health and well-being. Self-perceptions can include transient views of the self, such as how we view ourselves over time, as well as more en-

Research Theme	Sub-themes	Example projects
1. Self-perceptions, self-regulation, health, and well-being	- Personality and health - Self-perceptions over time and well-being	Goal stocktaking strategies and making healthy changes in the Estrie region
2. Chronic illness and pain management	- Music and pain management - Adjustment to chronic health conditions - Music and well-being	The effects of choir participation on well-being
3. Occupational well-being	- Stress in the workplace and well-being - Violence and aggression in the workplace	Developing better diagnosis, interventions, and policies in occupational mental health: A multi-disciplinary approach Investigating the links between anxiety and professional exhaustion
4. Use of health services	- Health and well-being of Anglophone minority in Quebec - Use of Complementary and Alternative medicine (CAM) - New technology development in the provision of health services	Access to health care in English in the Eastern Townships and its effects on population health laboration et valuation d interventions strat giques cibl es dans le but d am liorer la relation entre les professionnels de la sant et les usagers Anglophones de l Estrie Facilitating Anglophones access to English-language mental health services in the Estrie region
5. Stress, health, and well-being	- Effects of stress on bone health - Coping and resilience	Impact of the economic downturn on psychological health and well-being: A Quebec perspective
6. Promoting well-being	- Motivating health-promoting behaviours - Exercise and well-being - Alternative therapies and well-being, i.e., yoga, meditation, mindfulness	The effects of massage therapy on the executive functioning, physical and psychological well-being of individuals with fibromyalgia

Table 1: Six research themes for the Psychological Health and Well-being Research cluster and sample research projects.

during self-perceptions which are often referred to as personality. How people view themselves impacts not only the goals that they set but also how they approach the sometimes challenging business of trying to reach those goals. For example, seeing oneself as capable of achieving a goal is known to be a powerful motivator for working towards that goal, even in the face of difficult challenges (Bandura, 1986). Accordingly, both transient and more stable self-perceptions necessarily impact the self-regulation of thoughts, behaviours and emotions that are instrumental in the attainment of important personal goals. Indeed, from the perspective of human strengths and flourishing (Park, Peterson & Seligman, 2004), it is important to identify and nurture the characteristics and strategies that promote rather than interfere with adaptive goal regulation. The pursuit and attainment of personally meaningful goals is essential for individual and group survival (Taylor & Pham, 1996), and is associated with a variety of positive outcomes including life satisfaction and enhanced well-being (Martin & Tesser, 1996).

However, it is not only whether or not one is successful in attaining personal goals, but also how one engages in the process of attaining personal goals that has implications for well-being. Pursuing goals relentlessly in a single-minded "the end justifies the means" manner can be maladaptive by making the pursuit of goals joyless and difficult; this can eventually take a toll on health and well-being. The notion that well-being arises from engagement in the process rather than the outcome of goal pursuit is highlighted in the distinction made between telic and autotelic theory. According to Csikszentmihalyi (1982), telic theory locates well-being in the achievement of goals, whereas autotelic theory locates well-being in the movement or flow towards goals. This view is very closely aligned to the eudaimonic perspective of well-being and suggests that shifting the focus from the goal outcome to the goal process may also enhance well-being.

A research project conducted by cluster members that falls under this theme that is active at the time of this writing focuses on the goal strategies that people in the Eastern Townships use when they are trying to make healthy changes. In this project, Claude Charpentier and I examine how people take stock of their goals when they are trying to make healthy lifestyle changes and the implications of these strategies for their health and well-being. Specifically, we are interested in whether strategies that promote engaging in the process of goal pursuit rather than the end result of attaining goals can have beneficial consequences for psychological health and well-being. A secondary aim is to explore the role of self-perceptions or personality in the likelihood of engaging in adaptive goal stocktaking strategies.

Understanding and changing health behaviour is a critical issue that, from a public health perspective, can have significant implications for the health and well-being of people and communities across the life span. The rising rates of obesity and diabetes are directly attributable to poor lifestyle habits that are difficult for many people to change. The results from the research therefore have the potential to assist people who are struggling to reach their health behaviour goals and in this way might improve the health and well-being of people in the Eastern Townships and elsewhere.

Chronic illness and pain management. For individuals diagnosed with a chronic health condition, self-regulation is especially important for disease management and healthy psychological adjustment so as to help maximize their quality of life. Similarly, pain management is critical for those living with chronic conditions in which pain is a central feature. Laura Mitchell, one of the newest cluster members and a new faculty member at Bishop's University in the Department of Psychology, conducts research focused on novel approaches to pain management. Part of her research program focuses on the use of music to manage pain. Although a full detailing of the findings from this innovative research program is beyond the scope of this paper, one of the more interesting findings is counterintuitive to what might be expected with respect to the type of music that is most effective for reducing pain. Rather than classical, jazz or new age music, or any other particular genre of music, Mitchell's research has revealed that it is the listener's preferred music that has the best pain-relieving qualities (Mitchell, MacDonald, Knussen & Serpell, 2007).

In addition to continuing this line of research, Mitchell plans to investigate other ways in which music can enhance well-being. One planned project will examine the potentially beneficial effects of participating in choir for psychological health and well-being, focusing on none other than the members of the Bishop's University Singers.

Occupational well-being. Understanding and enhancing occupational well-being is an important topic of research that several cluster members have begun to address. A large proportion of our daily lives can be spent working; thus, whether or not one is satisfied with one's job or career can impact overall well-being (e.g., Harvey, Kelloway & Duncan-Leiper, 2003). Maximizing work-related or occupational well-being can therefore contribute to improved general psychological health and well-being.

A team of researchers, including cluster member and co-founder Steve Harvey from the Williams School of Business at Bishop's University, is currently examining ways of improving the detection of occupational mental health issues and developing interventions and policies for dealing with these issues to improve occupational well-being. Similarly, cluster member and co-founder Benoit Bacon and researchers from the Université de Sherbrooke are examining the role of anxiety in professional exhaustion, also known as "burnout". These are just two examples of ongoing projects that aim to improve our understanding of the factors and interventions that may help improve psychological health and well-being in the workplace for people in the Eastern Townships.

Use of health services. This research theme addresses several issues related to the use of both physical and mental health-care services that are of particular importance for Quebec's Eastern Townships given its large number of English-speaking community members. For example, access to health services in English is a key priority for English-speaking Townshippers when they are seeking care for a mental or physical illness (Pocock & Hartwell, 2010). However, not receiving care in one's first language can further complicate existing mental and physical health issues by generating unnecessary stress and because proper care may be foregone (Charpentier, Stout, Benoit, Poulin & Philip, 2011).

Taking a public health promotion approach (Frankish et al., 1996), several cluster members have undertaken research projects to address the issue of accessibility to health-care for the Eastern Township's English-speaking minority. Cluster members Claude Charpentier and Dale Stout from the Department of Psychology are involved in several ongoing research projects which spearhead efforts to address this important issue. One project aims to facilitate better access to needed health-care services in English for the English-speaking community in the Estrie region. Two other related projects headed by cluster member Estelle Chamoux from the Biology Department aim to examine the effects of the availability of health-care access in English on the health and well-being of the English-speaking minority in the Eastern Townships, and further to develop and evaluate interventions to improve the linguistic relationships between health-care providers and the English-speaking patients they treat. This team project involves a number of other cluster members including myself, Claude Charpentier, Dale Stout, Benoit Bacon and Steve Harvey.

Stress, health, and well-being. The deleterious effects of stress on both mental and physical health and well-being are well-established (Elzinga et al., 2008; László et al., 2010; Spruill, 2010), as is the role of individual differences in either amplifying or attenuating these effects (Charles, Gatz, Kato & Pedersen, 2008; Rasmussen, Wrosch, Scheier & Carver, 2006; Sirois, 2007; Sirois, Monforton & Simpson, 2010; Sirois & Tosti, in press). Research that improves our understanding of the factors that may help ameliorate stress and interventions that can help reduce stress are therefore of utmost importance for enhancing well-being. One ongoing project that I am currently conducting and that reflects the mandates of this theme involves examining the impact of the recession on the health and well-being of Quebec residents over time. In addition to understanding the extent to which the recession has affected people's lives, this study investigates the coping strategies and personality factors that may help buffer the harmful effects of recession-related stress on psychological health and well-being. Because the survey will be administered in both English and French, it will also be possible to examine how French- and English-speaking Quebecers may differ with respect to the impact of the recession and to the factors that promote resilience. These results in particular may provide some insight into how English-speaking people in the Eastern Townships have fared during these economically challenging times.

Promoting well-being. The focus of this final theme is on developing and applying interventions for improving well-being for those who may be at risk for poor well-being, as well as the activities that can promote and maintain well-being in a more pre-emptive manner. One planned project addresses the sub-theme of using alternative therapies for promoting health and well-being among people at risk for poor quality of life. Working with a local massage therapist and with cluster member Andrea Drumheller from Bishop's University's Department of Psychology, I hope to soon launch a study examining the effects of massage therapy for improving the psychological and physical health and well-being of people with fibromyalgia in the Eastern Townships. In addition to pain, sleeping difficulties and cognitive problems including memory issues and decision-making problems (i.e., "fibro fog") are a common debilitating issue in up to 70% of patients (Katz, Heard, Mills & Leavitt, 2004) that can affect their overall quality of life (Miró et al., 2011). This study will examine the effects of 8 weeks of massage therapy on the cognitive functioning of fibromyalgia patients and the associated benefits of this course of therapy for their physical and psychological well-being.

Conclusions

Psychological health and well-being is an important topic with important implications for functioning across a variety of life domains. Rather than simply being an outcome of having one's goals and dreams satisfied, it can enhance outcomes in work life, social and community life, close personal relationships, and even physical health. The recently formed Psychological Health and Well-being research cluster at Bishop's University endeavours to study the ways to better understand

and improve the psychological health and well-being of people in the Eastern Townships (and more globally) by focusing their research across six research themes.

Clearly there is room for overlap among the six research themes outlined. Promoting well-being can involve changing self-perceptions or cultivating the unique strengths and characteristics of individuals and communities to cultivate resilience and buffer stress, as well as using music and other alternative interventions to promote well-being among people with ongoing health issues. Improved access to healthcare for linguistic minorities in the Eastern Townships can minimize stress and promote well-being. Finally, addressing occupational stress can help minimize overall stress and improve health and well-being. By taking this multidisciplinary and multi-pronged approach, we hope to generate theoretical and practical knowledge as well as practical and accessible interventions that may help promote and improve the psychological health and well-being of people in the Eastern Townships.

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STRESS ET MALADIES OSSEUSES : DÉVELOPPEMENT D'UN MODÈLE POUR L'ÉTUDE DES IMPACTS DU STRESS SUR LA SANTÉ OSSEUSE DANS LES POPULATIONS À RISQUE

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Résumé

Le stress est un important déterminant de la santé d'une population. La population de l'Estrie, et plus particulièrement sa minorité anglophone, se trouve dans une situation socio-démographique favorisant de hauts taux de stress. Plusieurs systèmes physiologiques sont fortement affectés par les hormones sécrétées lors d'un stress et c'est particulièrement le cas du système ostéo-articulaire. Il est donc probable que de hauts niveaux de stress perturbent l'équilibre du métabolisme osseux et favorisent l'émergence de pathologies ostéo-articulaires telles que l'ostéoporose ou l'arthrite rhumatoïde. Les études sur le sujet sont parfois contradictoires et mal adaptées à l'étude de la situation chez l'être humain. De plus, il n'existe pas de méthode facile pour évaluer l'activité de résorption osseuse chez les individus d'une population. Nous présentons ici un modèle de culture cellulaire permettant de dériver des cellules ostéoclastiques humaines à partir d'une simple prise de sang. Nous montrons également que l'hormone principale sécrétée lors d'un stress, le cortisol, modifie les capacités résorbantes des cellules osseuses. Ces résultats donnent une base solide pour le développement d'une étude populationnelle évaluant l'impact du stress sur la santé osseuse de la population de l'Estrie.

Abstract

Stress is an important determinant of health in a population. People in the Eastern Townships, particularly the English-speaking minority, face a unique socio-demographic situation which may favour high stress levels. Several body systems are affected by stress hormones. This is particularly true for the skeletal system. It is likely that high levels of stress modify the balance of bone metabolism and favour

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bone and joint disorders like osteoporosis or rheumatoid arthritis. Studies on this subject are sometimes contradictory and poorly adapted to the study of the situation in humans. Moreover, no easy method exists to evaluate bone resorbing functions in the individuals of a population. The work reported here presents a model of cell culture generating human osteoclast-like cells from a simple blood sampling. We also show that the main human stress hormone, cortisol, modifies the resorbing capacities of bone cells. These results provide a solid foundation for the future development of a study at the population level, evaluating the impact of stress on bone health in the Eastern Townships.

Introduction

Le stress est l'un des plus importants déterminants de santé établis par Santé Canada[1]. Le rôle du stress sur la santé physique est multiple et complexe, d'autant plus qu'une considérable variabilité individuelle rend les études difficiles à analyser. On peut cependant établir plusieurs liens directs entre stress et santé physique grâce à une meilleure compréhension des effets physiologiques du stress[2]. La phase initiale du stress est caractérisée par une réaction intense et de courte durée au cours de laquelle les glandes médullo-surrénales, activées par le système nerveux central, sécrètent d'importantes quantités de catécholamines (adrénaline et noradrénaline essentiellement) dans le sang[3]. Après quelques minutes, les glandes cortico-surrénales sont activées à leur tour et sécrètent des glucocorticoïdes (principalement le cortisol et la cortisone chez l'Homme) pendant parfois plusieurs heures[3]. Si la situation stressante perdure, la sécrétion de glucocorticoïdes surrénaliens est appelée à durer dans le temps[3]. D'ailleurs, il est bien démontré que les personnes souffrant de dépression majeure ont des taux de cortisol sanguins significativement plus élevés que les personnes en bonne santé mentale[4].

Les effets des glucocorticoïdes sur l'organisme sont de plusieurs ordres et peuvent inclure l'inhibition de la fonction immunitaire, une augmentation de la pression sanguine, la modification du métabolisme et la redistribution des réserves de graisse corporelle ou encore une inhibition de la fonction reproductive[5-7]. L'un des systèmes physiologiques particulièrement touché par les effets délétères des glucocorticoïdes est le squelette[8]. En effet, bien qu'il s'avère souvent nécessaire d'administrer des glucocorticoïdes pour le traitement de maladies auto-immunes ou inflammatoires, les études réalisées sur des patients placés sous corticothérapie démontrent une diminution de la masse osseuse de près de 12% en moins d'un an. Après seulement trois mois de corticothérapie, le risque de fracture augmente de 75%[9-12] quel que soit le site étudié ou le régime de thérapie utilisé. Cependant, il reste difficile encore aujourd'hui de bien comprendre et prévenir les effets osseux des glucocorticoïdes. En particulier, l'impact de niveaux de glucocorticoïdes élevés dus à une situation stressante chronique reste à évaluer. Plusieurs études démontrent que la dépression[13-16] ou l'hypercorticisme subclinique[17-21] (taux de cortisol élevés) favorisent les problèmes de santé osseuse.

En 2008, une enquête réalisée auprès de la population québécoise montrait que 28% de la population ressentait un niveau de stress élevé[22]. La situation socio-démographique en Estrie est particulière et présente plusieurs spécificités contribuant à élever le niveau de stress ressenti et le risque de détresse psychologique[23-25]. De plus, la population anglophone de l'Estrie est généralement plus âgée, plus isolée et plus défavorisée matériellement que les autres personnes résidant en Estrie[26]. En raison des impacts psychologiques qu'elle peut entraîner, cette situation matérielle et sociale pourrait avoir de sérieux impacts sur la santé osseuse de la population estrienne.

De façon générale, les pathologies ostéo-articulaires sont en augmentation constante dans les pays occidentaux[28], une tendance accrue par le vieillissement des populations. Près de deux millions de Canadiens souffrent d'ostéoporose[28, 29], une pathologie osseuse le plus souvent asymptomatique jusqu'à l'apparition de fractures. Elle affecte majoritairement les femmes de plus de 50 ans[30]. Évalués à 1,9 milliards de dollars chaque année, les coûts engendrés par les traitements de l'ostéoporose ou de ses conséquences pèsent lourdement sur notre système de santé. Plus de la moitié des patients sont incapables de retourner à la maison à la suite d'une fracture de la hanche et sont orientés vers des soins de moyenne ou longue durée[31]. De plus, une vaste étude canadienne multicentrique sur l'ostéoporose (CaMOS) portant sur plus de 10,000 personnes établissait récemment que jusqu'à 70% des fractures de la hanche dues à l'ostéoporose provoquent la mort ou une incapacité permanente[27, 32]. L'ostéoporose représente donc une charge considérable sur les sociétés occidentales. Si un grand nombre de facteurs de risque ont été identifiés, on ne connaît pas de cause particulière à l'ostéoporose et la prévention fait une large part aux habitudes de vie (nutrition, exercice physique...), bien que la gestion du stress soit encore relativement peu prise en compte.

L'effet marqué des glucocorticoïdes sur le squelette est le résultat d'actions directes et indirectes sur le métabolisme osseux: jouant au niveau systémique sur le métabolisme endocrinien (inhibition de la sécrétion de stéroïdes gonadiques) et phosphocalcique (diminution de l'absorption intestinale et rénale du calcium)[33], les glucocorticoïdes agissent également dans le microenvironnement osseux[34, 35] et au niveau cellulaire. On rapporte un effet fortement inhibiteur sur les ostéoblastes, cellules responsables de la formation osseuse, et une modification des voies de signalisation de l'ostéoclaste, cellules responsables de la résorption osseuse[21, 36-38]. Si les effets inhibiteurs des glucocorticoïdes sur la formation osseuse sont bien documentés, il n'en va pas de même pour leurs effets sur la résorption. Or un squelette en santé dépend essentiellement de ces deux paramètres, soit la formation et la résorption osseuse, qui doivent être maintenues en équilibre tout en assurant un remodelage constant du tissu osseux[39]. Un cycle de remodelage débute par une intense activité des cellules résorbantes (ostéoclastes) menant à la formation d'une lacune de résorption. Une fois la lacune exposée au milieu environnant, sa surface est colonisée par des ostéoblastes qui combleront l'espace avec une matrice osseuse nouvellement synthétisée. Le recrutement et l'activité des ostéoblastes étant avant tout déterminés par l'activité initiale des ostéoclastes, la plupart des stratégies thérapeutiques visent à influencer le niveau de résorption[40, 41].

La plupart des études sur le sujet indiquent que les glucocorticoïdes augmentent la durée de vie des ostéoclastes[36, 42]. Par contre, l'effet des glucocorticoïdes sur l'ostéoclastogénèse et l'activité résorbante des ostéoclastes varient selon le modèle étudié[36, 38, 42-45]. Plusieurs études démontrent qu'une stimulation par les glucocorticoïdes enclenche une modification de l'architecture cellulaire (cytosquelette d'actine) et induit le détachement de l'ostéoclaste de sa matrice osseuse[36, 46]. En conséquence, dans ce modèle les glucocorticoïdes auraient un rôle plutôt inhibiteur sur la résorption osseuse, ce qui apparaît contradictoire avec les observations faites chez les patients humains. Une étude plus récente démontre au contraire que les ostéoclastes humains, stimulés in vitro par des glucocorticoïdes adhèrent plus solidement à la matrice osseuse et arrêtent de se déplacer à la surface de l'os[47]. Il en résulte des lacunes de résorption qui, au lieu d'être allongées et de faible profondeur, ont plutôt une allure de puits restreints en surface mais de plus grande profondeur. Ceci pourrait contribuer à fragiliser la structure de l'os en profondeur, d'autant plus que la partie résorbée est moins accessible aux ostéoblastes chargés de reformer la nouvelle matrice osseuse. Ces études sont cependant sporadiques et ne décrivent pas toujours les mécanismes cellulaires et moléculaires mis en jeu. Il n'existe pas de lignée cellulaire d'ostéoclastes humains et les modèles de rongeurs sont inadaptés. Prenant exemple sur un modèle bien établi à partir de cellules du sang de cordon ombilical[48-51], nous avons développé et raffiné un modèle d'ostéoclastes humains capables de résorber l'os in vitro, à partir de cellules du sang périphérique. Il s'agit d'un modèle de cultures primaires requérant temps et expertise, mais qui permet de faire face au défi le plus important pour ce genre d'études : **obtenir des cellules d'origine humaine ayant un fonctionnement se rapprochant des activités cellulaires *in vivo***. L'article présenté ici est une description du modèle d'étude suivie d'une analyse de l'action des glucocorticoïdes sur les interactions entre la cellule ostéoclastique humaine et la surface osseuse.

Matériels et méthodes

Modèle cellulaire d'ostéoclastes humains

Le modèle d'ostéoclastes humain est dérivé de monocytes du sang périphérique de donneurs volontaires recrutés dans la région de l'Estrie. Après avoir reçu toute l'information nécessaire, 27 femmes pré-ménopausées ont signé le formulaire de consentement et ont intégré notre protocole de recherche (approuvé par le comité d'éthique de l'Université Bishop's). En bref, 50 ml de sang périphérique ont été prélevés par prise de sang au pli du coude. Les leucocytes ont été isolés du sang par centrifugation (20 min, 2000 rpm) sur Ficoll-Paque (GE Healthcare), puis ensemencés sur une surface de verre traitée à une densité de 3 millions/ml et dans un milieu sélectif (OPTI-MEM supplémenté de 100pg/ml de GM-CSF[i]) pendant 24 heures. Les cellules non-adhérentes, correspondant en majorité aux lymphocytes et neutrophiles, ont été retirées après 24 heures en même temps que le milieu sélectif. Seules les cellules adhérentes, constituées en majorité de monocytes, restaient alors dans la culture. Un milieu de différenciation contenant du M-CSF[ii] (25 ng/ml) et du RANKL[iii] (100 ng/ml) a ensuite été ajouté et changé tous les 2 à 3 jours. Après quatre semaines, les cellules multinucléées générées ainsi expriment les marqueurs typiques des ostéoclastes (Calcitonine, V-ATPase, activité Phosphatase Acide Résistante au Tartrate) et sont capables de résorber l'os, tout comme cela avait été démontré pour les ostéoclastes dérivés de monocytes ombilicaux[49, 51, 52]. Au cours des deux dernières semaines de culture, des doses de cortisol humain variant de 10^{-11} à 10^{-5} M ont été ajoutées aux milieux de culture à chaque changement de milieu. Chaque dose de cortisol a été testée sur au moins 3 échantillons de cellules par donneuse.

Immunocytochimie Afin de vérifier l'expression de marqueurs indiquant la présence de cellules ostéoclastiques, les cellules ont été fixées à la fin de la période de culture à l'aide d'une solution de paraformaldéhyde 1% dans un tampon phosphate. Après plusieurs lavages, les sites non-spécifiques ont été bloqués avec une solution de

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i GM-CSF : Granulocyte Macrophage-Colony Stimulating Factor

ii M-CSF : Monocyte-Colony Stimulating Factor

iii RANKL : Receptor Activator of NF-kB Ligand lait écrémé 5% et les peroxydases endogènes saturées à l'aide d'une solution contenant 3% de peroxyde d'hydrogène. Des anticorps primaires dirigés contre le récepteur à la calcitonine (Santa Cruz Biotechnologies, utilisé 1:50) ou contre la pompe V-ATPase (BD biosciences, utilisé 1:50) ont été utilisés comme marqueurs[51]. Après une incubation d'une heure à 37°C, les cellules ont été lavées pour ôter l'excédent d'anticorps primaires puis recouvertes d'une solution contenant un anticorps secondaire universel couplé à la streptavidine (Dako Cytomation). Après 45 minutes d'incubation, l'excédent a été lavé puis une solution de biotine couplée à la peroxydase de raifort (Dako Cytomation) a été appliquée sur la culture de cellules durant 30 minutes. Après le retrait de l'excédent, un substrat incolore a été ajouté. Les sites contenant de la peroxydase ont pris une teinte rouge/brunâtre en raison de l'oxydation du substrat incolore. Un contre-marquage des noyaux a été réalisé à l'aide d'hématoxyline afin de concentrer l'analyse sur les cellules comportant plus de 3 noyaux.

Résorption osseuse

Le même protocole d'isolement et de culture cellulaire a été réalisé en présence d'une lamelle osseuse placée au fond du puits de culture. Les lamelles osseuses de 150 mm d'épaisseur ont été tranchées au laboratoire à partir d'os bovins obtenus dans le commerce. À la fin de la période de culture, les lamelles osseuses ont été retirées des puits et passées dans une solution contenant 1% de NaOH puis soniquées durant 1 minute afin de retirer les cellules de la surface osseuse[51]. Ensuite, les lamelles ont été immergées dans une solution de bleu de toluidine 1% durant 1 minute. Après rinçage à l'eau courante, la surface érodée correspondant aux lacunes de résorption laissées par les ostéoclastes apparaissait en bleu/violet.

Anneaux de résorption

À la fin de la période de culture, les ostéoclastes ont été fixés à l'aide d'une solution contenant 1% de paraformaldéhyde. Une solution de triton-100 1% a été appliquée durant 10 minutes afin de perméabiliser les membranes cellulaires, puis les sites non-spécifiques ont été bloqués grâce à une solution contenant 5% de lait écrémé. Une solution contenant de la Phalloïdine-Alexa633 (Invitrogen, utilisée 1:200) a été appliquée sur la culture cellulaire pendant une heure. Après lavage de l'excédent, un contre-marquage des noyaux a été effectué à l'aide d'une solution contenant du DAPI afin de visualiser les cellules multinucléées. Les lames ont ensuite été visualisées à l'aide d'un microscope confocal Olympus et prises en photo à l'aide d'une caméra numérique et du logiciel Fluoview.

Résultats & Discussion

Nous souhaitions pouvoir obtenir des ostéoclastes facilement, provenant d'individus de la population générale et en utilisant une procédure faiblement invasive. Un modèle d'ostéoclastes humains avait été développé il y a plusieurs années à partir de sang de cordon ombilical[49, 51, 52] : bien que très utile pour un grand nombre de recherches, il nous fallait modifier ce modèle de cellules fœtales afin de pouvoir étudier la physiologie des ostéoclastes provenant d'hommes ou de femmes adultes à différents stades de leur vie. Après avoir adapté et raffiné le protocole, nous avons isolé des cellules ayant les caractéristiques d'ostéoclastes matures capables de résorber l'os à partir du sang périphérique d'individus adultes. Dans le but de réaliser dans le futur des études populationnelles, il était important de valider ce modèle permettant d'obtenir des cellules ostéoclastiques humaines à partir d'une simple prise de sang. Comme le montre la Figure 1, les cellules générées par cette technique de culture sont multinucléées et expriment l'intégrine VLA-2 (récepteur du collagène) ainsi que la pompe V-ATPase. La pompe V-ATPase est une pompe nécessaire au recaptage actif des protons sécrétés dans la lacune de résorption et servant à dissoudre la matrice osseuse minérale[53, 54]. Localisée dans la bordure en brosse au contact de la matrice osseuse, la présence de cette pompe est fortement indicative d'ostéoclastes actifs (Figures 1A et D). L'intégrine VLA-2 n'est pas spécifique aux ostéoclastes puisqu'elle est retrouvée dans une vaste proportion de cellules. Cependant, ce récepteur du collagène est fortement exprimé dans la zone scellée entourant la lacune de résorption, indiquant alors la présence d'un ostéoclaste mature et bien adhéré à sa matrice (Fig. 1B et D). La présence de ces deux marqueurs localisés respectivement au niveau de la lacune de résorption et dans la zone scellée délimitant cette dernière nous indique que le processus de maturation de ces cellules est complet.

Parallèlement à ces marqueurs, nos analyses montrent la présence de lacunes de résorption à la surface des lamelles osseuses sur lesquelles les cellules ont été cultivées (Figure 2). Ceci indique que notre modèle de culture génère, à partir du sang périphérique de donneurs, des cellules exprimant les principales caractéristiques d'ostéoclastes matures et actifs. Nous travaillons en ce moment à l'étude des gènes exprimés dans ces cellules afin de parfaire la validation de notre modèle. Il doit nous permettre à l'avenir de déterminer si le cortisol influence la maturation et l'activation des ostéoclastes. En perspective, ce modèle nous permettra également de mesurer l'impact du stress ressenti sur l'ostéoclastogénèse.

Afin de déterminer l'effet du cortisol sur l'établissement d'un site de résorption caractérisé par l'apparition d'un anneau d'actine, des

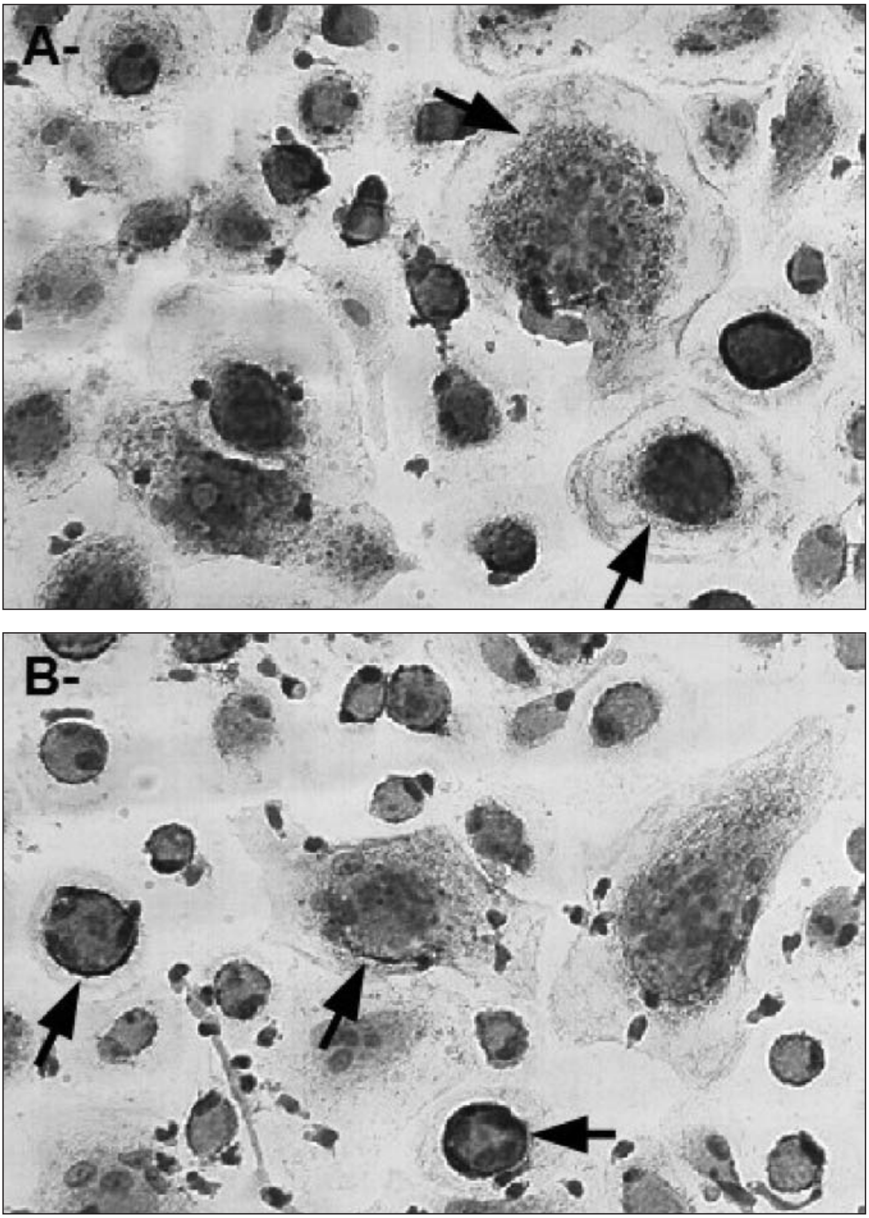
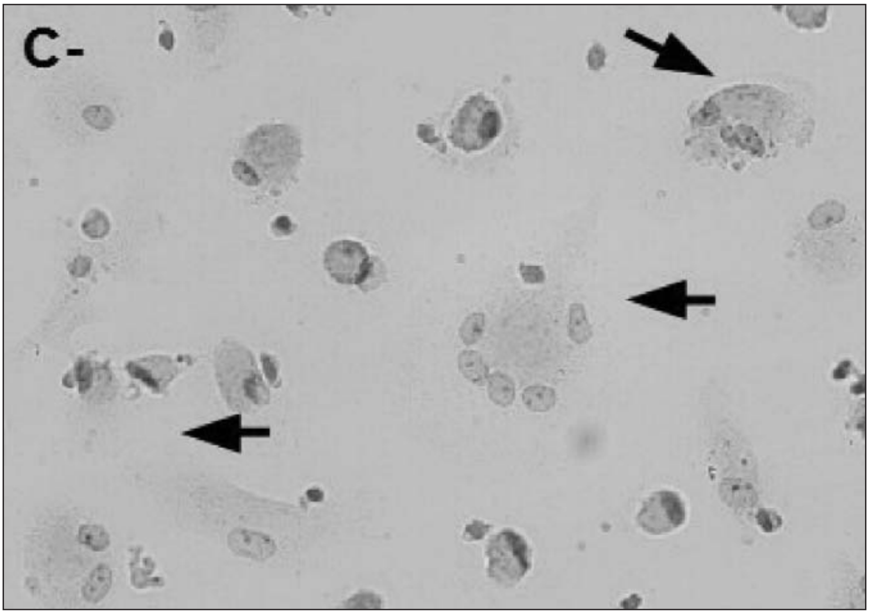
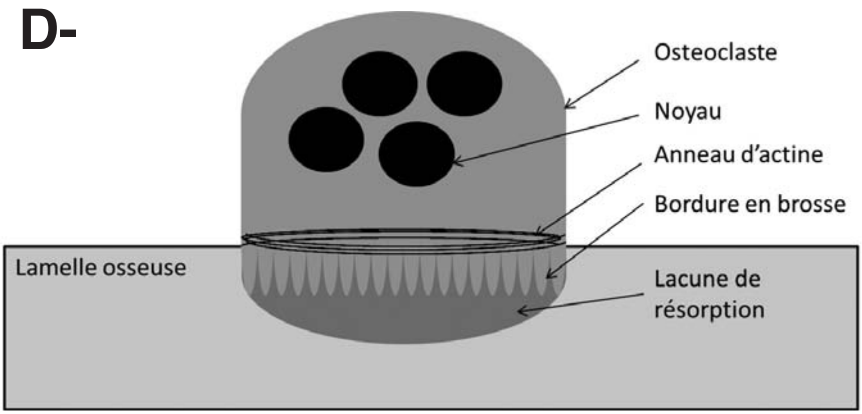


Figure 1 : Expression des marqueurs ostéoclastiques à la surface membranaire. Après culture, l'expression de marqueurs caractéristiques d'ostéoclastes matures a été analysée. A) Expression de la pompe V-ATPase, exprimée dans la bordure en brosse au contact de la lacune de résorption. La coloration brun-rouge représente les zones où cette pompe est exprimée, soit à l'intérieur de la zone scellée délimitant la lacune de résorption (flèches). B) Expression de l'intégrine VLA-2, récepteur du





collagène. L'expression de ce marqueur est retrouvée au niveau de la zone scellée, zone d'adhésion la plus forte de l'ostéoclaste à sa matrice (flèches). C) Marquage non-spécifique : sur cette lamelle, seul l'anticorps secondaire a été utilisé. On distingue bien les ostéoclastes par leur nombre de noyaux, marqués à l'hématoxyline, mais aucun marquage brun-rouge n'est présent attestant la spécificité des marqueurs utilisés. D) Schéma représentant un ostéoclaste résorbant la surface osseuse sur laquelle il est fixé.

cultivées en présence de doses croissantes de cortisol (Figures 3 B, C, soit 10^{-11} M, 10^{-10} M et 10^{-9} M respectivement, correspondant à la normale des taux circulants). Les doses de 10^{-7} à 10^{-6} M, correspondant à des taux élevés de cortisol sanguin, augmentent de façon notable le nombre et l'intensité des anneaux d'actine observés. Cette observation suggère que des niveaux de stress élevés pourraient favoriser l'établissement de sites de résorption. Bien que les mécanismes cellulaires mis en jeu n'aient pas encore été disséqués dans notre modèle, l'analyse d'autres études nous indique des pistes pour expliquer le rôle du cortisol sur l'adhésion de l'ostéoclaste à sa matrice osseuse : l'anneau d'actine est une structure constituée de protéines filamentaires organisées à la manière d'un squelette microscopique. Localisé à la jonction entre la membrane cellulaire et la surface osseuse, l'anneau d'actine est crucial pour maintenir l'adhésion et l'activité résorbante de l'ostéoclaste[55].

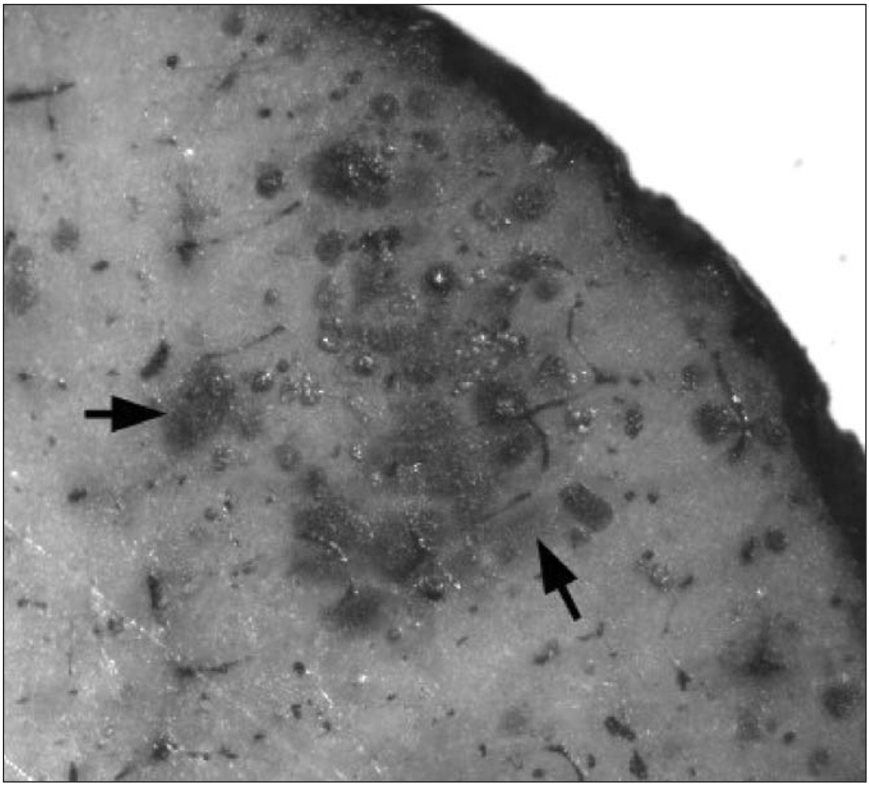


Figure 2 : Lacunes de résorption visualisées sur une lamelle osseuse. Après induction de la différenciation et de la maturation des cellules cultivées sur lamelles osseuses, les cellules ont été retirées et les lamelles osseuses colorées au bleu de toluidine. La lacune de résorption, dont la surface est érodée, fixe le colorant plus fortement que l'os non résorbé (flèches).

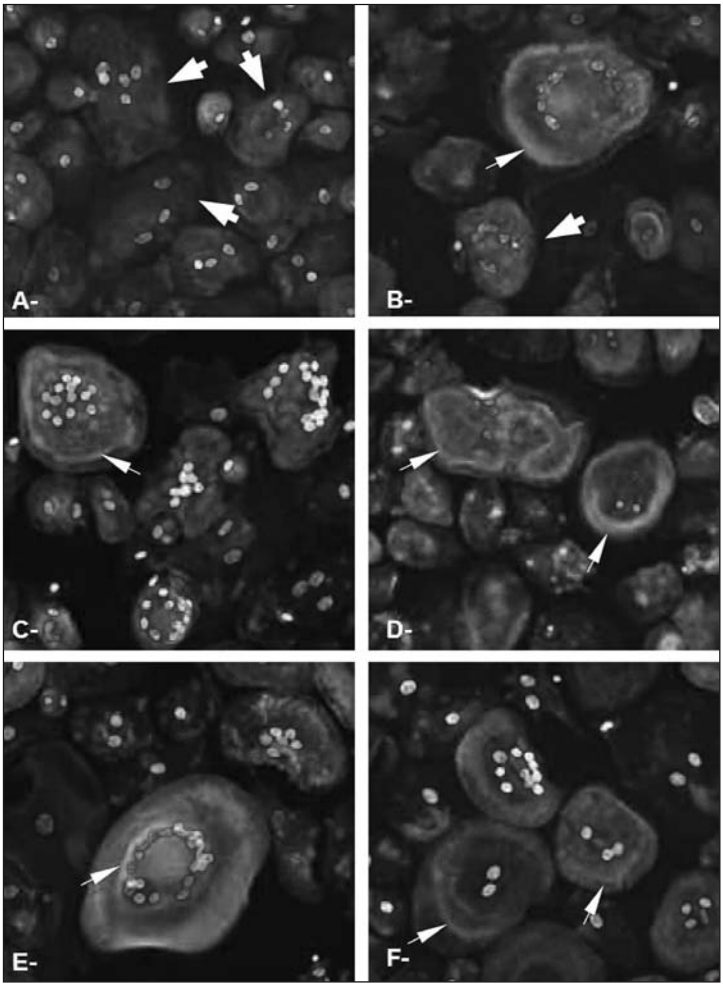


Figure 3 : Formation d'anneaux d'actine délimitant la zone scellée. Les cellules ont été cultivées pendant les deux dernières semaines de leur maturation en présence de doses croissantes de cortisol. L'un des échantillons n'a pas été traité au cortisol afin de servir de contrôle. Nous avons utilisé des doses de 10^{-11}M à 10^{-5}M afin de couvrir les taux physiologiques (<10^{-9}M) ainsi que les taux thérapeutiques ou pathologiques (>10^{-7}M). Toutes les photographies ont été prises à l'objectif 40X. A) Cellules non-traitées au cortisol. Les ostéoclastes multinucléés se distinguent clairement (grosses flèches), mais peu de cellules exposent un anneau d'actine bien délimité. B) À des doses aussi faibles que 10^{-11}M, un marquage plus dense de l'actine est observé dans la région de la zone scellée (petite flèche). C, D, E, F) Doses de 10^{-10}, 10^{-9}, 10^{-7} et 10^{-6}M respectivement: de plus en plus de cellules présentent un anneau d'actine bien marqué et franchement délimité (petites flèches). La proportion de cellules présentant ces anneaux d'actine semble augmenter avec la dose de cortisol utilisée.

Cet anneau d'actine demeure malgré tout extrêmement dynamique et se réorganise constamment afin de maintenir l'adhésion ou au contraire favoriser le détachement de l'ostéoclaste, en fonction des besoins et des stimuli hormonaux(56, 36, 46). Selon les mêmes études, toutes réalisées chez les rongeurs, les glucocorticoïdes induisent la dissolution de l'anneau d'actine et provoquent le détachement des ostéoclastes de la matrice osseuse. Nos résultats suggèrent au contraire que les cellules ostéoclastiques humaines sont plus fortement adhérentes à la surface osseuse lorsque du cortisol est présent dans le milieu de culture, ceci même à des doses physiologiques. Nos résultats correspondent à ceux d'une autre étude récente démontrant que les ostéoclastes humains mis en présence de glucocorticoïdes génèrent des lacunes de résorption plus profondes et moins étendues(47). En effet, plus l'anneau d'actine est marqué, moins l'ostéoclaste est susceptible de se détacher et de se déplacer à la surface de l'os(57). Afin de valider cette hypothèse, des études seront menées à l'aide d'enregistrements vidéo et le suivi de la migration des ostéoclastes à la surface osseuse sera analysé par des algorithmes de migration établis précédemment pour d'autres études.

Les résultats présentés ici sont encore préliminaires. Nous cherchions à valider un modèle d'étude nous permettant de réaliser des études populationnelles afin de déterminer si le niveau de stress subi au quotidien influence le niveau de résorption osseuse et, par là-même, le risque de déséquilibre entre résorption et formation osseuse. Cependant, nos résultats permettent d'élaborer une hypothèse de travail selon laquelle le cortisol favoriserait l'adhésion des ostéoclastes à la matrice osseuse et ainsi l'augmentation des sites de résorption. Notre modèle nous permettra dans l'avenir de tester cette hypothèse et éventuellement d'apporter des arguments physiologiques en faveur d'une prise en charge du stress pour la prévention et le traitement des maladies osseuses. Plusieurs études pointent la dépression, favorisée par le stress, comme un facteur de risque pour l'ostéoporose(14-16, 58). Il est également bien documenté que les patients souffrant d'arthrite rhumatoïde voient l'intensité de leurs symptômes suivre un rythme circadien proche de celui du cortisol(59, 60). Les taux de cortisol sont plus élevés chez les patients arthritiques que chez les sujets sains, mais on constate surtout que le rythme de sécrétion est modifié chez ceux ayant des atteintes sévères(61). Il est également clairement montré que les stress mineurs de la vie quotidienne affectent négativement le pronostic à long terme des patients arthritiques(62, 63). Plus encore, le développement de l'arthrite juvénile est souvent précédé d'un événement stressant majeur, peu de temps avant l'apparition des symptômes(64). De plus en plus de données permettent aujourd'hui de considérer le stress comme un facteur prédisposant et aggravant pour les maladies ostéo-articulaires, qu'elles soient de nature inflammatoire ou métabolique.

Un grand nombre de facteurs influencent également l'exposition de l'organisme aux glucocorticoïdes[4, 65]. Plusieurs facteurs sont d'importants vecteurs de stress dans la vie de tous les jours, notamment le statut socio-économique, l'isolement et les problèmes de santé[66, 67], des problématiques touchant plus particulièrement la minorité anglophone de l'Estrie[68]. Il est donc primordial de s'interroger sur les niveaux de stress, sur l'état de santé psychologique et des effets de ces derniers sur la santé générale de la population estrienne. La validation de notre modèle, présenté ici, nous permettra de réaliser une étude visant à déterminer les impacts de cette situation particulière sur la santé osseuse de la population de l'Estrie.

À plus long terme, les données obtenues devraient nous permettre de mieux comprendre les effets du bien-être psychologique sur le métabolisme osseux et de déterminer si de forts niveaux de stress constituent un facteur prédisposant et/ou aggravant pour les pathologies ostéo-articulaires. Si tel est le cas, nos conclusions pourraient ouvrir la voie à de nouvelles interventions de santé publique, plaçant le bien-être psychologique au cœur des stratégies de prévention des maladies osseuses, ceci dès l'atteinte du pic de masse osseuse. Les campagnes à l'heure actuelle mettent l'accent sur la nutrition et l'exercice physique. Promouvoir le bien-être psychologique pourrait constituer un autre angle d'attaque des campagnes de prévention ou au cours des traitements de réhabilitation.

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UN COMTÉ EN HÉRITAGE ? LES LIENS FAMILIAUX DES DÉPUTÉS PROVINCIAUX DES CANTONS-DE-L'EST DE 1829 À NOS JOURS

Jacques Gagnon
Cégep de Sherbrooke

Résumé
S'inspirant sur le plan méthodologique d'une typologie des « dynasties » parlementaires du Nord-Pas-de-Calais et d'un portrait global des parlementaires québécois, l'auteur traite de l'ensemble des liens familiaux tissés à l'intérieur de la députation provinciale des Cantons-de- l'Est de 1829 à 2008 pour ensuite tracer le profil socio-économique et politique des députés concernés.

Abstract
With the methodology used in identifying parliamentary « dynasties » for the Nord-Pas-de-Calais region and drawing upon the broader biographical sketches of Quebec Members of Parliament, the author of this paper discusses the issue of family lineage among the Members of Parliament of the Eastern Townships region for the 1829–2008 period. He then outlines the political and socioeconomic profiles of the deputies under study.

INTRODUCTION

Cette étude est la quatrième que nous consacrons au personnel politique des Cantons-de-l'Est mais il s'agit de la première qui s'intéresse à la dimension familiale[1]. Sur la scène fédérale, nous n'avons connu qu'un cas, celui des Tobin-Asselin, mais il en va autrement sur la scène provinciale avec 46 députés apparentés dans une vingtaine de familles.

Avant d'aller plus loin, nous avons effectué une revue de littérature sur le phénomène de la parenté en politique. Curieusement, peu d'études ont été menées sur le sujet dans les sociétés occidentales. Nous n'en avons trouvé que cinq entre 1969 et 2009[2]. Tentons une synthèse de nos lectures. Le phénomène de la parenté en politique diminue généralement avec le temps (Clubock et al. 1969 ; Ménager 1992 ; Dal Bo et al. 2009) mais il a tendance à perdurer dans les plus hautes sphères du pouvoir (Collectif 1988 ; Dal Bo et al. 2009). Même là, il conserve souvent une assise locale ou territoriale (Camp 1982 ; Collectif 1998 ; Dal Bo et al. 2009)[3]. Si sa diminution peut être interprétée comme un indice de démocratisation ou de modernisation politique (Clubock et al. 1969), sa persistance peut être vue comme une manifestation de la reproduction des élites politiques ou de la loi d'airain des oligarchies, selon les thèses classiques de Mosca et de Michels (Camp 1982 ; Dal Bo et al. 2009).

Il serait intéressant de comparer l'évolution de ces deux tendances dans d'autres sociétés afin de vérifier leur permanence. Mais nous ne pourrons pas le faire pour l'ensemble du Québec puisque notre étude ne porte que sur l'une de ses régions. Notre objectif de recherche est précisément d'étudier le phénomène de la parenté en politique pour la région des Cantons-de-l'Est depuis les débuts du XIX[e] siècle jusqu'à nos jours. Nous présenterons d'abord la région puis la population étudiée. Nous ferons ensuite le portrait des groupes familiaux retenus puis répondrons à la question qui justifie notre titre : « Un comté en héritage ? ». Après quoi, nous établirons le profil socio-économique et politique des députés concernés puis le comparerons à l'ensemble de la députation québécoise. En conclusion, nous synthétiserons nos découvertes principales.

LE TERRITOIRE ÉTUDIÉ

D'abord, quelques mots sur cette région[4]. L'Acte constitutionnel de 1791 décrète l'établissement d'une centaine de townships (cantons) pour les terres de la Couronne situées au sud-est des seigneuries du Régime français. Ces nouveaux cantons, bientôt occupés par des immigrants de la Nouvelle-Angleterre, sont aussi partagés entre les comtés de Bedford, Richelieu et Buckinghamshire pour des fins électorales. Mais leurs premiers députés sont pour la plupart catholiques, francophones et résidents de seigneuries[5]. Cela explique la demande de nouvelles circonscriptions plus représentatives des anglophones protestants de la région, d'autant plus que leur nombre s'accroît avec l'immigration supplémentaire venue des Îles britanniques à partir de 1815.

En 1829, l'ensemble des Cantons-de-l'Est est donc partagé en cinq comtés ayant droit à deux députés à cause de l'importance de leur population. Telles sont les règles électorales en vigueur à l'époque[6]. Il s'agit des circonscriptions de Sherbrooke, Stanstead, Missisquoi, Shefford et Drummond ; l'année suivante on leur ajoute Mégantic (Figure 1). En 1855, la région compte neuf comtés avec l'ajout de Brome, Richmond-Wolfe et Compton (Figure 2). L'Acte de l'Amérique du

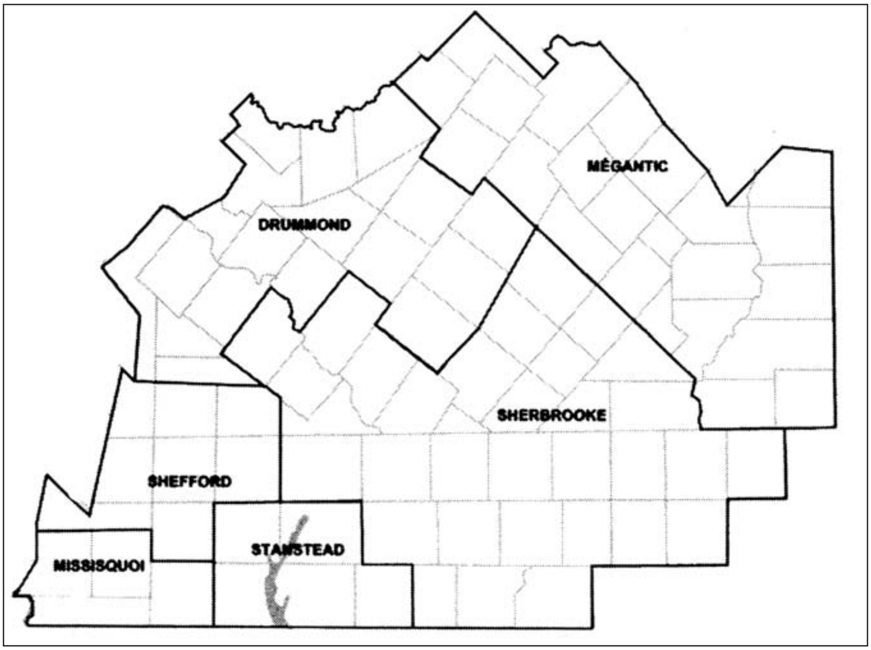

Figure 1 : Les circonscriptions des Townships en 1834

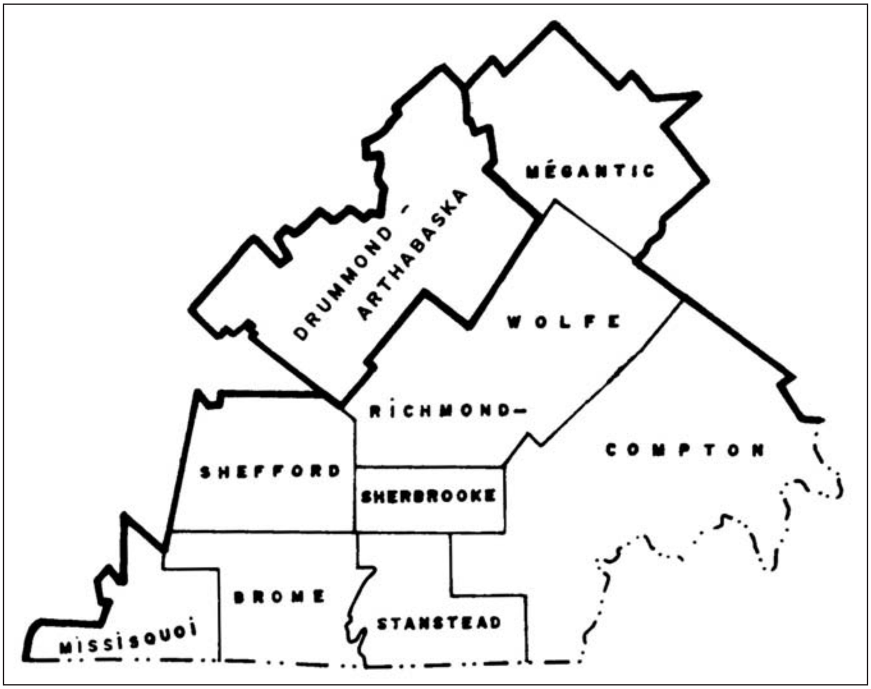

Figure 2 : Les circonscriptions des Townships en 1853

Nord britannique de 1867 va « protéger » les frontières des huit comtés anglophones[7], excluant Drummond-Arthabaska, déjà fortement francophone. Néanmoins, il y aura création de nouveaux comtés en 1890 avec la scission de Richmond-Wolfe et celle de Drummond-Arthabaska, puis en 1912 l'érection d'un douzième comté, celui de Frontenac, à la suite d'une partition de Compton (Figure 3).

Il faudra attendre 1972 pour assister à une refonte substantielle de la carte électorale régionale qui passe de 12 à 11 circonscriptions, lesquelles sont légèrement remaniées en 2001 (Figure 4). Wolfe et Stanstead disparaissent ; il y a fusion de Brome et Missisquoi, de Mégantic et Compton. Enfin, de nouvelles circonscriptions sont créées (Saint-François, Orford et Johnson). Cette dernière appellation veut d'ailleurs honorer un fils de la région, Daniel Johnson père, qui n'est cependant pas un élu des Cantons-de-l'Est. Venons-en donc à notre propos qui est de « tirer le portrait » de notre représentation régionale et d'en vérifier le degré de parenté.

LA POPULATION ÉTUDIÉE

La troisième édition du remarquable *Dictionnaire des parlementaires du Québec*, « le plus complet en son genre au Canada »[8], nous fournit une liste de 2 224 députés de 1792 à 2008. Pour notre région, on peut dénombrer 23 dénominations de circonscriptions, depuis les comtés de 1829 jusqu'à aujourd'hui[9] ; ces circonscriptions ont envoyé quelque 248 élus à Québec, ce qui représente 11,2 % de la députation totale (2 224) depuis 1792. Parmi eux se trouvent 73 individus ayant des liens de parenté avec d'autres parlementaires provinciaux (députés mais aussi conseillers législatifs, conseillers spéciaux, lieutenants-gouverneurs ou gouverneurs). Autrement dit, un peu moins du tiers (29,4 %) des députés provinciaux de la région a de telles affinités familiales. À partir des données du *Dictionnaire des parlementaires du Québec*, Martin Rochefort a calculé que 703 députés sur 2 224 avaient un lien de parenté avec d'autres personnalités politiques depuis 1792, soit 31,6 %[10]. On peut en conclure que notre région est à cet égard comparable à l'ensemble du Québec.

Cependant, notre question de recherche concerne plus précisément le lien entre le territoire et la députation. Limitons donc l'analyse aux députés provinciaux ayant des liens entre eux à l'intérieur des Cantons-de-l'Est. Notre population se réduit alors à 20 familles regroupant 46 députés sur 248 (18,5 %), ce qui correspond au pourcentage relevé par Bernard Ménager dans un tout autre contexte. Ce dernier constate que

> « [l]es dynasties parlementaires occupent une place non négligeable dans le personnel politique du Nord-Pas-de-Calais de 1851 à 1940. Nous avons recensé 27 familles englobant 65 élus, soit 18 % de l'effectif

Figure 3 : Les circonscriptions des Townships en 1912

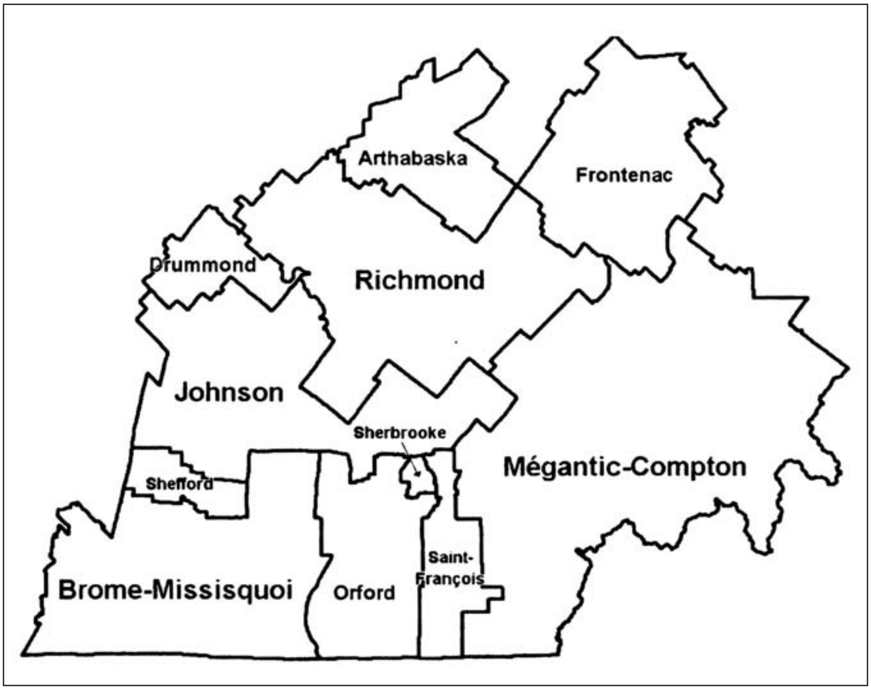

Figure 4 : Les circonscriptions des Townships en 2001

> total. Un tel constat suggère tout d'abord une approche quantitative du phénomène. Comment a-t-il évolué dans le temps ? Quel est le degré de longévité et de permanence de ces dynasties ? Où sont-elles circonscrites sociologiquement et géographiquement ? Peut-on les situer politiquement ? »[11]

C'est précisément le genre de questions auxquelles nous tenterons de répondre dans les pages suivantes. Dans un premier temps, nous traçerons le profil de ces groupes puis nous examinerons la transmission des circonscriptions à l'intérieur de ces groupes.

PROFIL DES GROUPES FAMILIAUX

Présentons d'abord un tableau d'ensemble que nous analyserons par la suite.

Groupe familial	Période	Mandats	Circonscription
Brooks-Sanborn	1829–1858	15 ans	Sherbrooke/ Compton
Chamberlin-Terrill	1833–1861	11 ans	Stanstead
Baker	1830–1838	9 ans	Missisquoi
Knowlton	1829–1834	5 ans	Shefford
Heriot-Watts	1829–1901	32 ans	Drummond/ Drummond-Arthab.
Knight-Hackett	1861–1900	14 ans	Stanstead
Foster-Robinson-McMaster	1841–1948	23 ans	Shefford/Brome/ Compton
Dunkin-Hemming	1858–1871	16 ans	Drummond-Arthabaska/Brome
Lovell	1878–1902	7 ans	Stanstead
Girouard	1886–1942	15 ans	Drummond-Arthab./ Arthabaska
Bissonnet	1904–1935	31 ans	Stanstead
Oliver	1917–1931	14 ans	Brome
Bullock	1912–1944	24 ans	Shefford
Laferté	1901–1934	26 ans	Drummond
Lemieux	1921–1962	18 ans	Wolfe
French	1946–1956	10 ans	Compton
Gérin	1938–1960	13 ans	Stanstead
Gardner	1966–1989	8 ans	Arthabaska

Groupe familial	Période	Mandats	Circonscription
Bélanger-Gosselin-Gonthier	1976–	29 ans	Sherbrooke/ Mégantic-Compton
Boucher	1994–	14 ans	Johnson

Nos neuf premières familles sont anglophones et les quatre dernières, francophones (y compris les Gardner, nonobstant leur patronyme) ; les sept familles intermédiaires sont de l'une ou l'autre communauté linguistique. Seize familles comptent 2 députés provinciaux dans leurs rangs, deux en comptent 3, autant en comptent 4, pour un total de 46 élus.

Cinq familles entreprennent leur parcours politique sous le régime de l'Acte Constitutionnel de 1791, trois sous l'Acte d'Union de 1840 et 12 sous l'Acte de l'Amérique du Nord britannique de 1867. Parmi ces dernières, deux familles initient leurs mandats sous le règne des Conservateurs (1867–1897), cinq sous le règne des Libéraux (1897–1936), trois à l'époque de l'alternance Libéraux-Union nationale (1936–1970), deux depuis que l'on connaît l'alternance Libéraux-Parti québécois (1970 à aujourd'hui).

Le nombre d'années de mandats politiques varie entre cinq ans et 32 ans. La durée moyenne des mandats de l'ensemble des 20 familles est de 16,7 années et la médiane, de 14 ans.

UN COMTÉ EN HÉRITAGE ?

Bien sûr, ce sont les électeurs qui choisissent les élus. Mais rien n'interdit aux élus d'être parents. C'est dans ce sens qu'on peut parler de transmission familiale d'une circonscription. Cependant, cette question demande un examen plus pointu du territoire. Au fil du temps, les redécoupages de la carte électorale ont pu scinder des circonscriptions autrefois plus étendues. C'est le cas de Sherbrooke et Compton ainsi que de Drummond et Drummond-Arthabaska.

Circonscription	Groupe familial	Nombre de députés
Stanstead	Chamberlin-Terrill	3
	Knight-Hackett	2
	Lovell	2
	Bissonnet	2
	Gérin	2
Shefford	Knowlton	2
	Foster	2
	Bullock	2

Circonscription	Groupe familial	Nombre de députés
Drummond-Arthabaska	Heriot-Watts	3
	Dunkin-Hemming	2
Arthabaska	Girouard	2
	Gardner	2
Sherbrooke-Compton	Brooks-Sanborn	2
Missisquoi	Baker	2
Brome	Oliver	2
Wolfe	Lemieux	2
Johnson	Boucher	2
Compton	French	2
Mégantic-Compton	Bélanger-Gonthier	3

On constate que nos 20 groupes familiaux ont hérité chacun d'une circonscription à un moment ou l'autre de l'histoire. Au total, nous avons 23 cas de legs de circonscription, puisque trois familles ont trois députés dans la même circonscription. La transmission se fait de père en fils dans neuf cas, entre frères dans six cas, de beau-père à gendre et entre cousins dans trois cas, entre époux et entre mère et fille dans un cas. Ce legs de circonscription entre parents peut se faire sans délai, c'est-à-dire en deux élections successives, ou il peut prendre un certain laps de temps. Pour nos circonscriptions, on observe huit transmissions immédiates, sept transmissions avec un intervalle d'une élection générale, huit transmissions avec un intervalle de deux élections générales et plus. Mais qu'ils s'effectuent tôt ou tard, ces legs de circonscription se situent toujours à l'intérieur d'une ou deux générations successives, tout au plus.

Telles sont les principales informations que l'on peut extraire du tableau des familles et de la liste présentée en annexe. Pour le reste de notre étude, nous allons nous inspirer des premières pages du *Dictionnaire des parlementaires du Québec* pour comparer les députés apparentés dans notre région à l'ensemble des députés du Québec.

PROFIL SOCIO-ÉCONOMIQUE DES DÉPUTÉS

La durée moyenne des carrières parlementaires

Pendant combien d'années nos députés ont-ils occupé leur poste ? Comparons la durée moyenne des carrières pour l'ensemble du Québec entre 1867 et 2008 avec celle de nos 46 députés entre 1829 et 2008.

Durée	Québec	Cantons-de-l'Est
Moins d'un an	3,7 %	2,2 % (1 député)
1 an et plus	96,3 %	97.8 % (45 députés)
5 ans et plus	58,0 %	58,7 % (27 députés)
9 ans et plus	32,1 %	30,4 % (14 députés)
13 ans et plus	15,8 %	13 % (6 députés)
17/18 ans	7,8 %	10,9 % (5 députés)
21/22 ans	4,4 %	2,2 % (1 député)

L'auteur de l'article du *Dictionnaire des parlementaires du Québec* conclut que « pour la grande majorité des élus, représenter des électeurs ne peut donc être considéré comme une carrière de par son caractère temporaire. »[12] Il en va de même dans notre région, semble-t-il.

Les causes de la fin de la carrière des parlementaires

Cette fois, nous comparerons le Québec et les Cantons-de-l'Est pour l'ensemble de la période 1792–2008, tout en retranchant deux de nos 46 députés qui sont en début de mandat.

Causes	Québec	Cantons-de-l'Est
Défaite électorale	35,3%	31,8 % (14 députés)
Ne s'est pas représenté	32,3 %	27,3 % (12 députés)
Démission	10,0 %	6,8 % (3 députés)
Décès	8,0 %	18,2 % (8 députés)
Charge incompatible	7,1 %	11,4 % (5 députés)
Constitution changée	4,9 %	4,5 % (2 députés)

On constate, comme dans le tableau précédent, que notre région suit la tendance du reste du Québec, hormis le plus grand nombre de décès de députés en cours de mandat.

La proportion de parlementaires nés hors du Québec

224 des 2 224 parlementaires élus dans l'ensemble du Québec depuis 1792 sont nés hors de la province (10 %). Les régions d'origine de ces nouveaux venus sont dans l'ordre : les États-Unis (23 %), le reste du Canada (19 %), l'Écosse (18 %), l'Angleterre (13 %), l'Irlande (8 %) et la France (6 %). Vingt-deux de nos 46 députés sont nés hors des Cantons-de-l'Est (47,8 %); dix sont nés en Nouvelle-Angleterre, huit dans d'autres régions du Québec et quatre en Angleterre. On comprend que le grand nombre de *Yankees* est lié au peuplement d'origine des Cantons-de-l'Est et que les Anglais participent de la deuxième vague d'immigration initiée vers 1815.

Les principaux groupes professionnels représentés en Chambre

Les deux dernières élections générales tenues sous le régime de l'Acte constitutionnel de 1791 envoient à Québec sept députés estriens apparentés, qui sont tous des gens d'affaires. Pourtant, ce groupe professionnel ne compte que pour le tiers de l'ensemble de la députation québécoise où on trouve autant, sinon plus, de membres des professions libérales. Sous le régime de l'Acte d'Union, notre députation locale est plus conforme à celle de l'ensemble du Québec, incluant cinq membres de professions libérales contre trois hommes d'affaires. Pendant la période 1867–1960, la région élit dix hommes d'affaires et treize membres des professions libérales, ce qui la distingue de l'ensemble du Québec où les gens d'affaires sont deux fois moins nombreux que les professions libérales (25 % contre 56 %). De 1960 à 2008, la députation estrienne inclut trois hommes d'affaires et autant de représentants du secteur para-public ainsi que deux députés venus respectivement des milieux associatifs et du personnel politique. On note l'absence des professions libérales qui comptent toujours pour au moins 25 % de la députation québécoise. Bref, l'originalité de nos députés apparentés se manifeste par un plus grand recrutement chez les gens d'affaires, sauf sous le régime de l'Acte d'Union (1841–1867).

PROFIL POLITIQUE DES DÉPUTÉS

Au cours des 180 dernières années, la scène politique québécoise s'est habituellement partagée en deux camps opposés : Patriotes et *Reformers* contre Bureaucrates et *Tories*, Rouges contre Réformistes, Libéraux contre Conservateurs, Union nationale et Parti québécois[13]. On pouvait s'attendre à ce que les députés d'une même famille fussent de la même couleur politique mais il n'en va pas ainsi sous les régimes de l'Acte constitutionnel et de l'Acte d'Union. Plusieurs députés vont eux-mêmes changer d'orientation politique d'un mandat électoral à l'autre!

La situation va se stabiliser sous l'Acte de l'Amérique du Nord britannique qui voit les Conservateurs s'installer au pouvoir pour une trentaine d'années (1867–1897). Les députés locaux apparentés seront toutefois assez partagés entre Libéraux et Conservateurs. À l'époque de l'hégémonie libérale qui va de 1897 à 1936, tous nos députés apparentés adhèrent à ce parti. Au temps de l'alternance Libéraux-Union nationale (1936–1970), les deux tiers de nos députés apparentés sont des Unionistes. Et pour la période actuelle d'alternance Libéraux-Parti québécois, les deux grands partis se partagent les députés locaux assez également.

Période	Appui ou appartenance politique	Total
1829–1838	4 Reformers/Tories, 2 Tories, 1 Reformer	7
1840–1867	4 Conservateurs, 2 Libéraux/Conservateurs, 1 Libéral, 1 Modéré	8
1867–1897	3 Libéraux, 2 Conservateurs, 1 Conservateur/Libéral	6
1897–1936	9 Libéraux	9
1936–1970	6 Unionistes, 3 Libéraux	9
1970–2008	4 Libéraux, 3 Péquistes	7

CONCLUSION

On dit en boutade des recherches académiques qu'elles nous en apprennent de plus en plus sur des sujets de plus en plus étroits. Pour libérer nos patients lecteurs de cette fâcheuse impression, allons-y d'un résumé en guise de conclusion.

Dans notre région, près d'un député provincial sur cinq (46 sur 248) est parent d'un autre député provincial entre 1829 et 2008. Mais il n'y a que quatre familles sur 20 qui comptent plus de deux députés provinciaux dans leurs rangs. Plus de la moitié des familles concernées sont anglophones, surtout d'origine américaine; le tiers de nos députés apparentés est né hors Québec (contre 10 % pour l'ensemble des députés québécois). Le phénomène de l'apparentement de nos députés n'est absent d'aucune période historique. Quant au lien de parenté privilégié, il s'agit le plus souvent d'un père et de son fils ou de deux frères. Dans les deux tiers des cas, la transmission de l'héritage est immédiate (d'une élection à la suivante) ou limitée à l'intervalle d'une élection. La circonscription de Stanstead est celle qui a connu le plus grand nombre de députés apparentés, suivie de Shefford, Drummond-Arthabaska et Arthabaska.

La durée moyenne d'une carrière politique est la même pour nos députés apparentés que pour l'ensemble de la députation québécoise. Les causes de la terminaison de carrière sont semblables, à cette exception que nous avons connu proportionnellement plus de décès en cours de mandat. Parmi nos députés apparentés, les gens d'affaires ont souvent été sur-représentés et les membres des professions libérales sous-représentés par rapport à l'ensemble des parlementaires québécois.

Enfin, les allégeances partisanes de nos députés apparentés sont très fluctuantes sous les régimes de l'Acte constitutionnel et de l'Acte d'Union (1829–1867). Dans le dernier tiers du 19e siècle, ces députés sont partagés entre les deux grands partis même si les gouvernements québécois sont habituellement conservateurs. Dans le premier tiers du 20e siècle, nos députés sont exclusivement libéraux, à l'instar des gouvernements de l'époque. Nous avons deux fois plus de députés unionistes que libéraux quand ces deux partis se concurrencent (1936–1970) et presque autant de députés péquistes que libéraux au cours de la période contemporaine (1970–2008).

Revenons en finale sur un constat de notre revue de littérature effectuée en introduction. Au Congrès américain comme à l'Assemblée nationale française, nos chercheurs ont constaté une diminution avec le temps de l'importance de la parenté en politique (Clubock et al., 1969 ; Ménager, 1992 ; Dal Bo et al., 2009). Dans les Cantons-de-l'Est, nous remarquons plutôt deux cycles de diminution dont le premier couvre le XIXe siècle alors que le second s'étend sur l'ensemble du XXe siècle (voir l'Annexe). Répétons qu'il serait intéressant de vérifier l'évolution du phénomène pour l'ensemble de la députation québécoise au fil du temps, mais que ce n'était pas le propos de cet article rédigé pour une revue d'études régionales.

ANNEXE

Cette annexe est le résultat de notre compilation manuelle des données du *Dictionnaire des parlementaires du Québec*. La présentation de nos groupes familiaux suit un ordre spatio-temporel à partir du premier mandat exercé et elle va dans le sens Sud-Ouest-Nord-Est.

Période de l'Acte constitutionnel (1791–1841)

BROOKS, Samuel, député de Sherbrooke, 2e siège (1829–1831 et 1844–1849), beau-père de John Sewell SANBORN, député de Sherbrooke, 2e siège puis de Compton (1850–1858).

CHAMBERLIN, Wright, député de Stanstead, 1er siège (1833–1834), beau-père de Timothy Lee TERRILL, député de Stanstead (1852–1861), frère de Hazard Bailey TERRILL, député de Stanstead (1851–1852).

BAKER, Stevens, député de Missisquoi, 1er siège (1830–1834), frère de William BAKER, député de Missisquoi, 1er siège (1834–1838).

KNOWLTON, Lyman, député de Shefford, 1er siège (1829–1830), cousin de Paul Holland KNOWLTON, député de Shefford, 1er siège (1830–1834).

HERIOT, Frederick George, député de Drummond, 1er siège (1829–1833), cousin de Robert Nugent WATTS, député de Drummond (1841–1851), père de William John WATTS, député de Drummond-Arthabaska (1874–1886) puis de Drummond (1890–1892 et 1897–1901).

Période de l'Acte d'Union (1841–1867)

KNIGHT, Albert, député de Stanstead (1861–1867), beau-père de Michael Felix HACKETT, député de Stanstead (1892–1900).

FOSTER, Stephen Sewell, député de Shefford (1841–1848), père d'Asa Belknap FOSTER, député de Shefford (1858–1860), lequel est grand-père de Jonathan ROBINSON, député de Brome (1936–1948), gendre d'Andrew Ross McMASTER, député de Compton (1929–1931).

DUNKIN, Christopher, député de Drummond-Arthabaska (1858–1861) puis de Brome (1862–1871), cousin d'Edward John HEMMING, député de Drummond-Arthabaska (1867–1871).

Période de la domination des Conservateurs au gouvernement québécois (1867–1897)

LOVELL, Henry, député de Stanstead (1878–1881), père de Moody Brock LOVELL, député de Stanstead (1890–1892 et 1900–1902).

GIROUARD, Joseph-Éna, député de Drummond-Arthabaska puis d'Arthabaska (1886–1898), père de Wilfrid GIROUARD, député d'Arthabaska (1939–1942).

Période de la domination des Libéraux au gouvernement québécois (1897–1936)

BISSONNET, Prosper-Alfred, député de Stanstead (1904–1913), père d'Alfred-Joseph BISSONNET, député de Stanstead (1913–1935).

OLIVER, William Robert, député de Brome (1917–1923), frère de Carlton James OLIVER, député de Brome (1923–1931).

BULLOCK, William Stephen, député de Shefford (1912–1931), père de Charles Munson BULLOCK, député de Shefford (1939–1944).

LAFERTÉ, Joseph, député de Drummond (1901–1909), père d'Hector LAFERTÉ, député de Drummond (1916–1934).

LEMIEUX, Joseph-Pierre-Cyrénus, député de Wolfe (1921–1933), père de Gérard LEMIEUX, député de Wolfe (1952–1956 et 1960–1962).

Période de l'alternance des Libéraux et de l'Union nationale (1936–1970)

FRENCH, Charles Daniel, député de Compton (1946–1954), frère de John William FRENCH, député de Compton (1954–1956).

GÉRIN, Henri, député de Stanstead (1938–1939), frère de Léon-Denis GÉRIN, député de Stanstead (1948–1960).

GARDNER, Roch, député d'Arthabaska (1966–1970), frère de Laurier GARDNER, député d'Arthabaska (1985–1989).

Période de l'alternance des Libéraux et du Parti québécois (1970–2008)

BOUCHER, Claude, député de Johnson (1994–2007), père d'Étienne-Alexis BOUCHER, député de Johnson (2008 à ce jour).

BÉLANGER, Fabien, député de Mégantic-Compton (1980–1983), oncle de Gérard GOSSELIN, député de Sherbrooke (1976–1981) et époux de Madeleine BÉLANGER, députée de Mégantic-Compton (1983–2003), mère de Johanne GONTHIER, députée de Mégantic-Compton (2007 à ce jour).

SOURCE ET PRÉPARATION DES CARTES

Figure 1

Source : Gilles Laporte, *Patriotes et Loyaux* (Sillery: Septentrion, 2004), 66.
Préparé par Gilles Ash, Centre des médias, Cégep de Sherbrooke

Figure 2

Source : Marcel Hamelin, *Les premières années du parlementarisme québécois (1867–1878)* (Québec: PUL, 1974), encarté entre 16 et 17.
Préparé par Gilles Ash, Centre des médias, Cégep de Sherbrooke

Figure 3

Source : Robert Gagnon, *Les Cantons de l'Est* (Montréal et Toronto: HRW, 1970), 2.
Préparé par Gilles Ash, Centre des médias, Cégep de Sherbrooke

Figure 4

Source : Commission de la représentation électorale du Québec, *Carte électorale du Québec 2001*, http://www2.electionsquebec.qc.ca/fr/pdf/carte_recto.pdf
Préparé par Gilles Ash, Centre des médias, Cégep de Sherbrooke

NOTES

1 « Petite histoire politique des Cantons de l'Est » et « Portrait politique actuel des Cantons de l'Est » dans Jean-Marie M. Dubois, dir., *Les Cantons de l'Est* (Sherbrooke: Les Éditions de l'Université de Sherbrooke 1989), 155–187 ainsi que « La représentation politique des Cantons-de-l'Est au tournant du 21^{e} siècle » dans *Revue d'études des Cantons de l'Est*, no 28 (2006): 23–40.

2 Alfred B. Clubok et Norman M. Wilensky, « Family Relationships, Congressional Recruitment, and Political Modernization, *The Journal of Politics 31* (1969): 1035–1062.

Roderic A. Camp, « Family Relationships in Mexican Politics : A Preliminary View », *The Journal of Politics 44*, (1982): 848–862.

Bernard Ménager, « Typologie de dynasties parlementaires » dans Claude Patriat et Jean-Luc Parodi, dir., *L'hérédité en politique* (Paris: Economica 1992), 123–140.

Collectif, « Dossier : Familles et pouvoir », *Croissance*, no 417, (juillet-août 1997): 19–41.

Ernesto Dal Bo, Pedro Dal Bo et Jason Snyder, « Political Dynasties », *Review of Economic Studies 76*, (2009): 115–142.

3 Qu'on pense aux Kennedy du Massachusetts ou aux Bush du Texas et de Floride, par exemple.

4 Pour une histoire brève mais complète de la région, voir Guy Laperrière, *Les Cantons-de-l'Est* (Québec: Presses de l'Université Laval, 2009), 197 p.

5 Sauf dans le comté de Bedford dont six députés seront Protestants et anglophones. Le député John Jones de Bedford (1809–1810 et 1820–1821) est d'ailleurs le père du député de Missisquoi Robert Jones (1841–1844).

6 Commission de la représentation électorale du Québec, *Historique de la carte électorale*, http://www2.electionsquebec.qc.ca/lacartechange/fr/histo_carte.asp

7 Auxquels il faut ajouter quatre comtés de l'Outaouais et de la Montérégie. L'article 80 de l'Acte de l'Amérique du Nord britannique stipule qu' « il ne pourra être présenté au lieutenant-gouverneur du Québec, pour qu'il le sanctionne, aucun bill à l'effet de modifier les délimitations des divisions ou districts électoraux énumérés dans la deuxième annexe du présent acte, à moins qu'il n'ait été adopté à ses deuxième et troisième lectures, dans l'assemblée législative, avec le concours de la majorité des députés représentant toutes ces divisions ou districts électoraux ». Cette disposition restera en vigueur jusqu'en 1970 bien que la région soit majoritairement francophone depuis 1881.

8 Division de la recherche de la Bibliothèque de l'Assemblée nationale du Québec (Martin Rochefort, directeur, et Frédéric Lemieux, chargé de projet), *Dictionnaire des parlementaires du Québec de 1792 à nos jours* (Québec: Les Publications du Québec, 2009), 842 p. Notre citation tirée de la «Présentation» du *Dictionnaire* (p. XIII) souligne avec raison l'importance de cet ouvrage à l'échelle canadienne.

9 Circonscriptions de Sherbrooke, Ville de Sherbrooke, Compton, Saint-François, Stanstead, Orford, Missisquoi, Missisquoi-Ouest, Missisquoi-Est, Brome, Brome-Missisquoi, Shefford, Drummond, Drummond-Arthabaska, Arthabaska, Sherbrooke-Wolfe, Richmond-Wolfe, Wolfe, Richmond, Johnson, Mégantic, Mégantic-Compton, Frontenac.

10 Martin Rochefort, directeur de la Division de la recherche à la Bibliothèque de l'Assemblée nationale du Québec, communications en date des 9 mars, 10 avril, 16 avril, 7 mai et 21 juillet 2010.

11 Ménager, « Typologie de dynasties parlementaires », dans Patriat et Parodi, *L'hérédité en politique*, 123.

12 «Portrait des parlementaires québécois», dans *Dictionnaire des parlementaires du Québec*, 2.

13 Pour un aperçu plus complet des partis depuis 1827, voir Robert Boily « Généalogie des groupes et partis politiques » dans Vincent Lemieux, *Personnel et partis politiques au Québec* (Montréal: Boréal Express, 1982), 38–39.

L'ARCHITECTURE RÉSIDENTIELLE DU VIEUX SHERBROOKE, 1870–1915 : L'EXEMPLE DES MAISONS MOREY ET JOHNSTON

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Résumé
Cet article établit une comparaison entre deux bâtiments résidentiels du Vieux Nord de Sherbrooke qui correspondent à deux étapes du développement de ce quartier. Caractéristiques de l'influence des courants anglo-saxons, notamment américains, sur l'architecture des Cantons-de-l'Est, les deux maisons se distinguent par le style, l'organisation de l'espace, les matériaux utilisés et le rang social des premiers propriétaires. En se basant sur la typologie définie par Luc Noppen et Lucie K. Morisset, l'auteure propose une évaluation de la valeur patrimoniale des deux maisons. L'étude, fondée sur des documents originaux, permet d'authentifier une réalisation de Joseph Wilfrid Grégoire, un architecte très actif dans la région des Cantons-de-l'Est durant la première moitié du XXe siècle.

Abstract
The premise of this article is to compare two residential buildings located in Sherbrooke's Old North (Vieux Nord)*, buildings that correspond to two phases in the development of this neighbourhood. Good examples of the influence of Anglo-Saxon and especially of American architectural trends on the architecture of the Eastern Townships, these two homes have distinct styles, spatial organization and building materials that reflect on their original owner's social status. Building upon a framework defined by Luc Noppen and Lucie K. Morisset, the author will seek to evaluate the heritage value of these two homes. This paper, based on original documents, also identifies Joseph Wilfrid Grégoire, an Eastern Townships architect renowned in the first half of the twentieth century, as the designer of one of the two homes under study.*

Introduction

Marquée par l'arrivée en territoire abénakis des Américains, Loyalistes mais aussi entrepreneurs et aventuriers, et des immigrants britanniques, la région des Cantons-de-l'Est se distingue des autres régions du Québec par une architecture fortement influencée par la tradition et les styles anglo-saxons. L'architecture résidentielle des Cantons-de-l'Est trouve ainsi peu sa place dans les ouvrages d'histoire de l'architecture au Québec (voir Lessard, Laframboise, Martin) qui insistent davantage sur la maison française avec son toit à larmier, ses lucarnes en façade et sa galerie couverte. Le quartier de la ville de Sherbrooke communément appelé le Vieux Nord témoigne de cette habitation à l'anglaise dont la variété des styles présente un intérêt particulier pour l'histoire de l'architecture au Québec.

Cette étude s'attarde à deux bâtiments résidentiels du Vieux Nord : la maison Morey, construite autour de l'année 1873, et la maison Johnston, bâtie en 1914. Situées chacune à une extrémité de ce quartier résidentiel, elles correspondent, sur une période de près d'un demi-siècle, à deux étapes du développement de ce qui constitue le principal quartier historique de Sherbrooke. Elles occupent ainsi deux bornes, spatiales et temporelles, qui permettent de relier leur construction à l'histoire de la ville.

Bien qu'appartenant au même quartier, les maisons Morey (Figure 1) et Johnston (Figure 2) présentent des caractéristiques archi–tecturales très différentes qu'il est intéressant de contraster. Outre leurs particularités, l'intérêt de ces deux maisons repose, d'une part, sur leur bon état de conservation et, d'autre part, sur la disponibilité de documents les concernant. La maison Morey a fait l'objet d'une description par la Société d'histoire des Cantons de l'Est (SHCE, 1978). Sont ainsi accessibles des plans des étages, un dessin d'élévation de la façade, des photos extérieures et intérieures, une photo ancienne et un plan d'implantation. Quant à la maison Johnston, il existe des plans, des élévations, un devis de construction ainsi que le certificat de localisation.

Le développement urbain du Vieux Nord de Sherbrooke

La ville de Sherbrooke se développe au début du XIX^{e} siècle à la croisée des rivières Magog et Saint-François dont le potentiel hydraulique attire des entrepreneurs venus des États-Unis (Kesteman, 2000). Dès les années 1820, le village possède un Palais de justice, une prison, des églises, un moulin, une scierie et quelques commerces. En 1852, sous l'impulsion du milieu des affaires, Sherbrooke est reliée au circuit du chemin de fer entre Montréal et Portland dans l'état du Maine. Ce lien à la métropole et aux États-Unis aura une influence considérable sur le développement économique de la ville et viendra consolider le pouvoir de la classe d'affaires dirigeante très majoritairement anglo-saxonne et protestante. Cette élite dispose d'un réseau de relations qui la lie à des représentants de la bourgeoisie de grandes villes comme Montréal, Toronto, Londres ou New York (Kesteman, 2001).

Figure 1 : Maison Morey (1873), SHCE, 1978.

Figure 2 : Maison Johnston (1914). Photographie : Silvie Bernier, 2009.

En 1859, le milieu des affaires se dote d'un levier économique puissant en créant la Eastern Townships Bank (ETB) qui favorise la création de manufactures, entre autres dans le secteur des textiles. Jean-Pierre Kesteman estime que la valeur du capital investi dans les manufactures sherbrookoises passe de 138 000 $ en 1867 à près d'un million en 1891 (Kesteman, 2001). Parmi les actionnaires de la Eastern Townships Bank on retrouve le premier propriétaire de la maison Morey, Thomas Slade Morey (SHCE, 1978).

La croissance économique entraîne un accroissement de la population. Entre 1861 et 1896 la ville de Sherbrooke voit sa population tripler. Celle-ci passe de 2 974 à 9 746 habitants (Kesteman, 2001). Durant la même période, l'activité commerciale se déplace vers la rue Wellington qui sert d'axe de communication entre la gare sur la rue Dépôt et la Haute ville où se trouvent le Palais de justice, la Eastern Townships Bank, le Bureau de poste et d'autres commerces. La rue Commercial (renommée Dufferin en 1905) dans la Haute ville s'étire vers le nord et accueille des résidences cossues de la bourgeoisie d'affaires attirée par la proximité des institutions financières. La luxueuse villa que se fait construire Thomas S. Morey en 1873 se trouve à l'angle des rues Moore et Commercial. C'est la naissance du quartier du Vieux Nord dont le développement prendra fin vers les années 1960.

Un autre phénomène qui contribue à l'apparition de nouveaux quartiers résidentiels est l'instauration à partir de 1897 d'un réseau de tramways à travers la ville (Kesteman, 2002). Plusieurs lignes de la Sherbrooke Street Railway, rebaptisée en 1910 Sherbrooke Railway & Power, relient les différents quartiers de la ville, notamment le quartier Nord. Ce système de transport en commun facilite grandement le déplacement en ville et permet à des classes moins fortunées qui ne possèdent pas de voitures (à cheval ou à moteur) de délaisser le centre-ville pour habiter des zones plus paisibles. Le prolongement en 1918 de la ligne de tramway vers les rues Ontario et Portland contribue au développement du quartier au-delà de la limite de la rue de London. La maison Johnston est située précisément à l'angle des rues Dominion et Ontario, soit la limite ouest du circuit du tramway.

Bien que le prolongement de la ligne de tramway facilite l'accès à des secteurs plus éloignés du quartier Nord, la population de ce quartier résidentiel demeure pendant longtemps anglophone et relativement aisée. Jean-Pierre Kesteman (2002) rapporte qu'en 1908 l'évaluation moyenne des maisons dans le quartier Nord est de 6 982 $ comparativement à 2 160 $ sur la rue Alexandre, habitée essentiellement par des ouvriers. Tout comme pour la ville de Sherbrooke dans son ensemble, la population du Vieux Nord connaît une francisation constante au cours des XIX[e] et XX[e] siècles (Kesteman, 2001). Cette transformation ethnique et linguistique se vérifie dans l'évolution des propriétaires des maisons Morey et Johnston, toutes deux construites pour des anglophones et qui deviendront respectivement en 1976 et 1977 la propriété de francophones (Registre foncier du Québec).

Le quartier Nord de Sherbrooke, tout comme une grande partie des terres des Cantons-de-l'Est, appartient depuis 1833 à une compagnie foncière britannique, la British American Land Company (BALC). Celle-ci achète à bas prix d'immenses terrains de la couronne, qu'elle subdivise en lots pour la revente (Kesteman, 2001). Ce cadastre privé sera supprimé en 1875 lors d'un nouvel arpentage commandé par la ville et l'instauration d'un cadastre public (Kesteman, 2001). Le lot 184, situé à l'angle des rues Dominion et Ontario, qu'Hubert B. Johnston achète le 11 juillet 1914 au coût de 950 $, est encore la propriété de la BALC (Deed of Conveyance, no 2131, archives privées).

De la villa de banquier au cottage du col blanc

La maison que se fait construire Thomas Slade Morey a pour fonction non seulement de loger confortablement sa femme, Huldah Jane Foote, enseignante, et son fils unique Samuel, mais aussi d'afficher la réussite sociale de l'homme d'affaires (Nadeau Saumier, 2007). Originaire de Hanover au New Hampshire, Thomas S. Morey s'établit en 1843 à Eaton Corner dans les Cantons-de-l'Est où il tient un magasin général. Devenu rentier à l'âge de 50 ans, il s'installe à Sherbrooke en 1871 et participe à la vie économique de la ville en tant qu'administrateur de la Sherbrooke Permanent Building Society et de la Eastern Townships Bank (Nadeau Saumier, 2007). En 1872, il achète le lot 962 de la rue Commercial, propriété de Mme Nydia Willard, veuve de William Richardson Willard (Registre foncier du Québec). La Société d'histoire des Cantons de l'Est évalue la construction de la maison Morey aux environs de 1873 (SHCE, 1978). Chose certaine, la maison est déjà construite en 1881 puisqu'elle apparaît sur une carte de la ville de l'époque (*City Atlas of Sherbrooke*, 1881) et porte le numéro 56.

La maison Morey est une villa imposante formée d'un premier corps de bâtiment de 42 pieds de largeur par 32 pieds de profondeur comportant deux étages et demi en plus du sous-sol. À l'arrière, deux annexes prolongent la maison. La première, sur deux étages, est un carré de 20 pieds de côté. La deuxième sur un seul étage mesure environ 19 pieds de côté. Ces espaces sont prolongés par un vestibule et une grande galerie ouverte à l'avant, ainsi que par une véranda fermée derrière le salon.

À l'intérieur, l'organisation de l'espace respecte la structure en trois pavillons (Figure 3). Le pavillon principal est réservé aux maîtres de

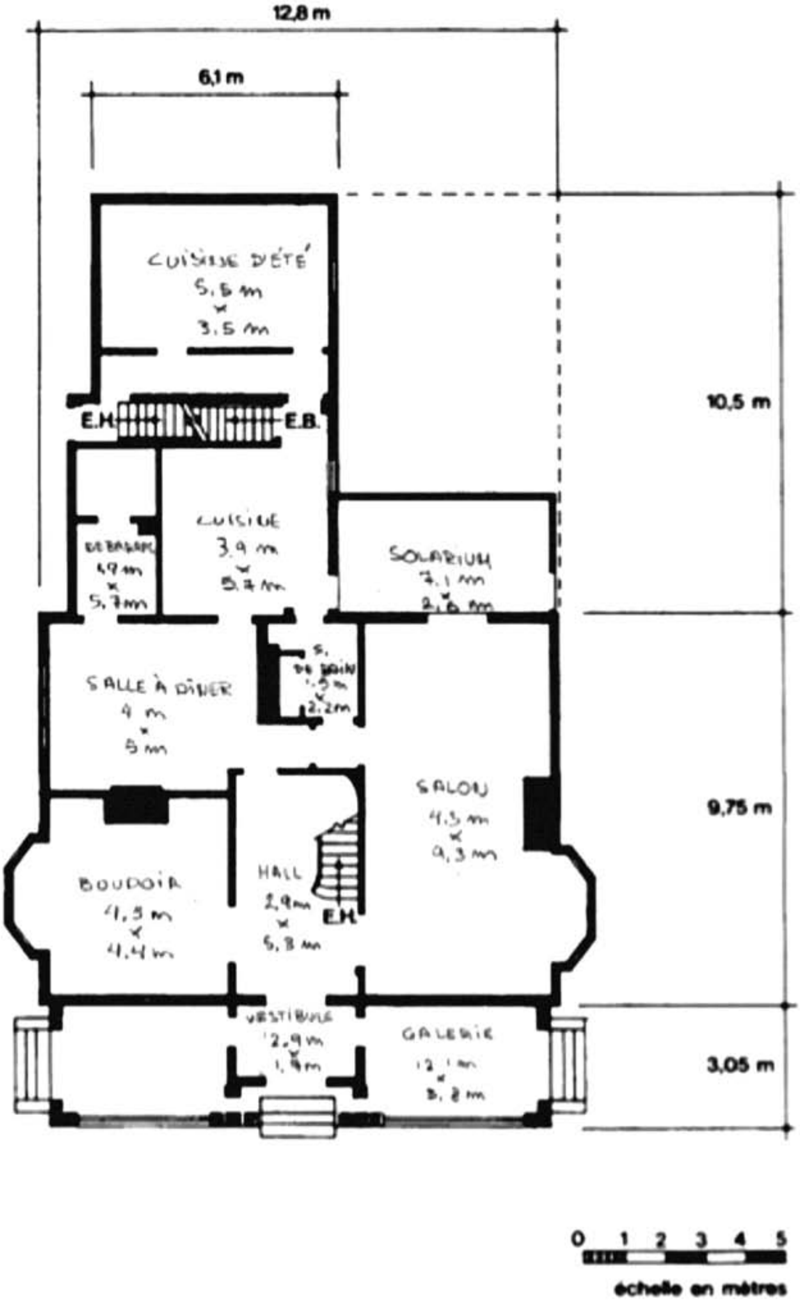

Figure 3 : Maison Morey, plan du rez-de-chaussée, SHCE, 1978.

la maison et correspond aux espaces servis. À droite du hall se trouve un vaste salon qui s'étend sur toute la profondeur de la maison et s'ouvre sur une véranda vitrée, tandis que du côté gauche de la maison la bibliothèque précède la salle à dîner qui, elle, communique avec la cuisine. L'étage est subdivisé en 4 chambres de bonnes dimensions et une salle de bain (Figure 4). Le pavillon à l'arrière est réservé aux espaces servants. On y trouve au rez-de-chaussée la cuisine, un grand

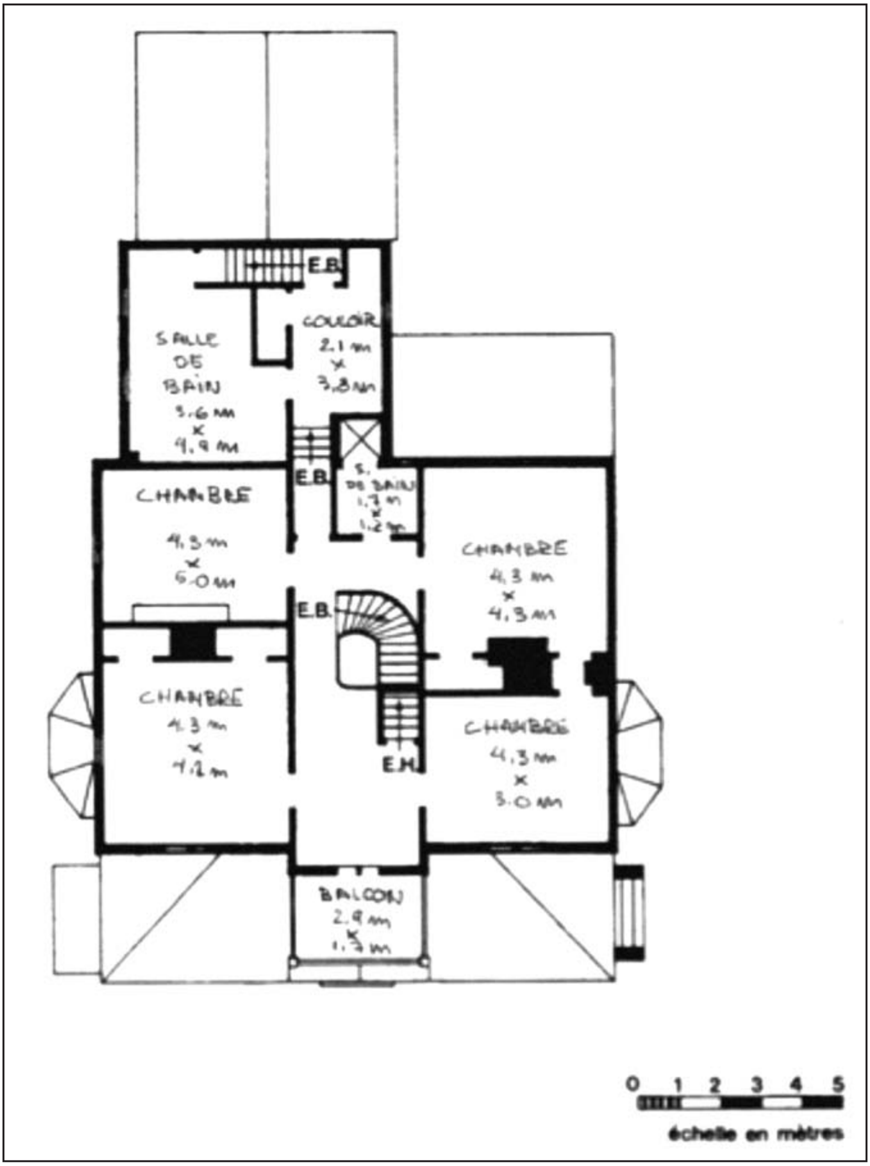

Figure 4 : Maison Morey, plan de l'étage, SHCE, 1978.

placard et l'escalier de service. Au-dessus à l'étage se trouvaient les chambres des domestiques. Cet espace est aujourd'hui reconverti en une grande salle de bain. Le troisième pavillon n'a qu'un seul étage et sert de cuisine d'été. Ainsi, la maison Morey reproduit la division tripartite de l'architecture classique à savoir : « pièces d'apparat, chambres privées et pièces de service » (Pigeon, 1982 : 58).

Cette organisation horizontale de l'espace où les pièces situées à l'avant ont une fonction différente des pièces se trouvant à l'arrière est combinée à une organisation verticale de l'espace où cette fois le rez-de-chaussée correspond aux zones de jour plus publiques. L'étage est, par ailleurs, réservé à la zone privée de la nuit aussi bien pour les maîtres que pour les domestiques. Un escalier de service mène à la cave à partir de la cuisine tandis qu'un escalier droit mène des chambres au grenier. La distinction entre les pièces d'apparat et les pièces plus intimes est renforcée par la hauteur des plafonds qui diminue avec les étages. Ainsi, le rez-de-chaussée a des plafonds de 11 pieds de haut, ce qui accroît le volume des espaces et contribue à l'effet de grandeur et d'élégance. À l'étage, les plafonds de 9 pieds de haut sont plus adaptés au caractère intime des chambres à coucher.

La maison Johnston est de plus petites dimensions. Son propriétaire Hubert Baker Johnston la fait construire en 1914 alors qu'il est âgé de 24 ans, grâce à un emprunt de 5 500 $ à James S. Mitchell, un important distributeur d'accessoires de plomberie, de fer et de charbon du Québec (Registre de la ville de Sherbrooke, no 65868, archives privées et Nadeau Saumier, 2007). Récemment marié à Edythe Marguerite Green, le jeune Johnston est représentant de commerce pour la compagnie Fairbanks, spécialisée dans la fabrication et la vente d'instruments de pesée et installée dans le quartier sud de la ville. Employé d'une grande entreprise américaine, il représente les aspirations de la classe moyenne qui, sans avoir l'aisance de la bourgeoisie, aspire à un certain confort et à un statut supérieur. Le contrat de construction basé sur les plans de l'architecte Joseph Wilfrid Grégoire indique avec précision les matériaux à utiliser et témoigne du souci de construire une maison de qualité : « Cover the first floor of the ground and first floor with birch or maple flooring 2 ½ inches in width by 7/8 inches in thickness tongued and grooved, first quality, no shorter than 4 feet… » (contrat de construction, archives privées).

La maison unifamiliale que H.B. Johnston commande à J.W. Grégoire est un cottage de deux étages. Plus profond que large, le plan mesure 27 pieds par 35 pieds (Figure 5), auquel s'ajoute à l'étage (Figure 6) et donnant sur la cour arrière un solarium de 8 pieds par 12 pieds. En 1995, un deuxième solarium sera ajouté au rez-de-chaussée en dessous du premier en fermant le perron par des fenêtres et par une

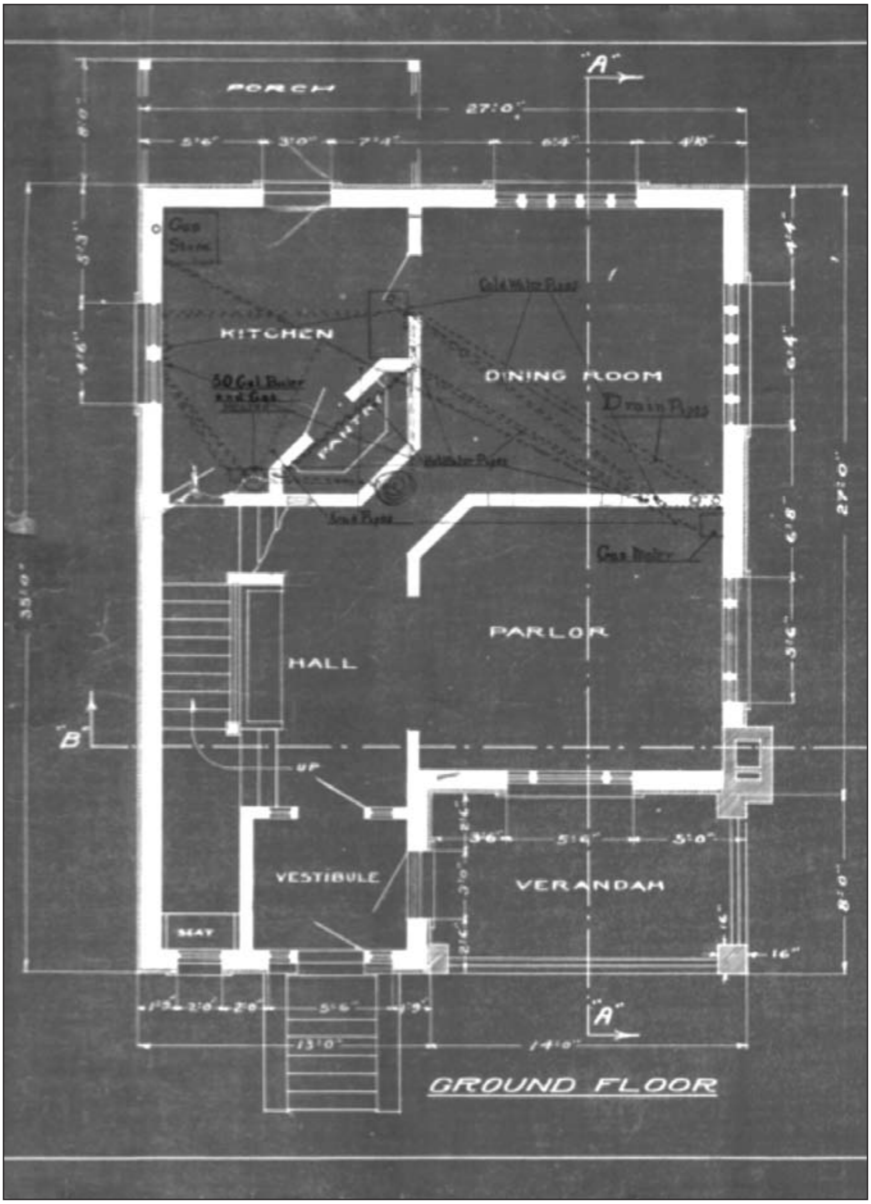

Figure 5 : Maison Johnston, plan du rez-de-chaussée, archives privées.

porte patio. Les plafonds de 9 pieds de hauteur au rez-de-chaussée sont limités à 8 ½ pieds à l'étage.

Malgré leurs proportions différentes, les plans des deux maisons présentent des similitudes. Dans les deux cas, on accède à l'intérieur de la maison par un vestibule très vitré qui donne sur un hall, à droite

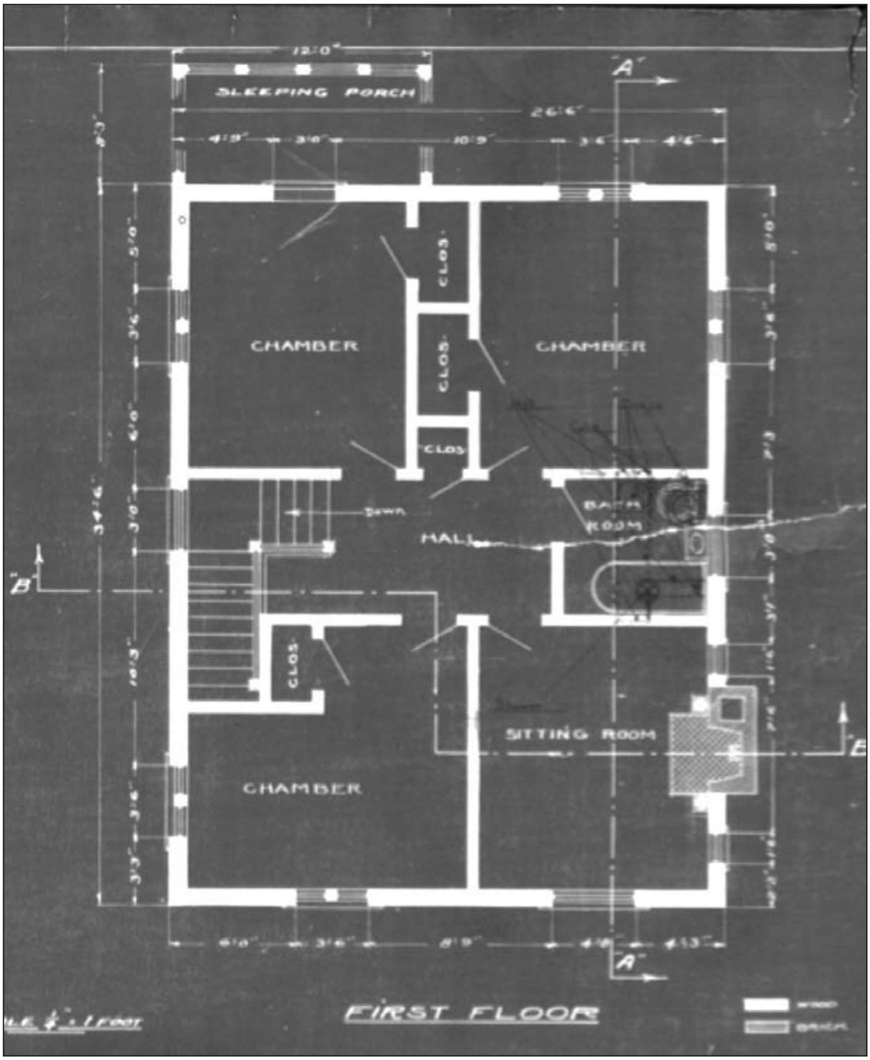

Figure 6 : Maison Johnston, plan de l'étage, archives privées.

duquel se trouve le salon. Toutefois, l'escalier, qui est central dans la maison Morey, longe le mur de gauche dans la maison Johnston. Ce décentrement vers la gauche de l'escalier qui mène à l'étage et de celui qui mène à la cave fait en sorte que les pièces du rez-de-chaussée occupent le côté droit de la maison, (salon et salle à dîner) ou l'arrière (cuisine et nouveau solarium). La division très symétrique de l'espace dans la maison Morey ne se retrouve pas au rez-de-chaussée de la maison Johnston. Toutefois, l'étage des deux maisons est subdivisé en quatre pièces de dimensions semblables qui gravitent autour d'un hall central.

Figure 7 : Maison Johnston, salle à dîner. Photographie : S. Bernier, 2010.

Dans les deux cas, la cuisine est à l'arrière au niveau rez-de-chaussée et communique par une porte avec la salle à dîner. La présence de la cuisine au rez-de-chaussée est caractéristique des maisons américaines, les maisons anglaises ayant plutôt tendance à refouler au sous-sol les espaces de service (Pigeon, 1982).

Tout comme dans la maison Morey, la progression du public vers le privé dans la maison Johnston se fait à la fois de l'avant à l'arrière de la maison et du bas vers le haut (si on exclut la cave), et les espaces de nuit sont concentrés à l'étage. Toutefois, ce qui distingue la maison Johnston de la maison Morey est l'absence d'espaces réservés à la domesticité. Dans la maison Johnston, les tâches domestiques sont vraisemblablement assumées par la maîtresse de maison, ce qui témoigne de la classe sociale des propriétaires mais aussi de l'époque de sa construction où la présence de domestiques tend à diminuer même chez les classes plus fortunées (Rybczynski, 1989).

Dans les deux maisons, des moulures encadrent les ouvertures des portes et des fenêtres. Les deux salles à manger comportent aussi d'imposants panneaux de bois teint et verni qui couvrent une bonne partie des murs, sinon la totalité, et concourent à donner à ces pièces un caractère riche et solennel (Figures 7 et 8). On peut se surprendre qu'une maison malgré tout modeste comme la maison Johnston dispose d'une salle à dîner aussi imposante à la fois par sa taille, 12 ½

Figure 8 : Maison Morey, salle à dîner, SHCE, 1978.

pieds par 14 ½ pieds (ce qui en fait la plus grande pièce de la maison), que par sa décoration. On peut supposer qu'il s'agit là du désir du propriétaire, typique de la classe moyenne supérieure, d'afficher les signes d'un certain luxe et de la réussite financière. Mais on peut y voir également une influence du style Arts and Crafts, véhiculé aux États-Unis par Gustav Stickley notamment dans sa revue *The Craftsman*, qui accorde une place de choix à la salle à manger. Les moulures très sobres et les lignes pures des éléments décoratifs tels que la rampe d'escalier ou les bancs de quêteux confirment l'attrait de l'architecte Grégoire pour ce style (Mayer, 1994).

Le foyer, présent dans chaque pièce de la maison Morey mais limité au boudoir dans la maison Johnston, s'harmonise à la décoration intérieure des deux résidences. Véritable système de chauffage dans la première maison, il a une fonction davantage décorative dans la deuxième où là encore il vise à exprimer l'aisance de ses occupants. Le manteau de la cheminée tout en bois de chêne flanqué de ses deux pilastres a des allures classiques. Ici aussi on s'étonne qu'une pièce à l'étage, dont la fonction est plutôt privée, affiche un luxe généralement réservée aux pièces de réception. On peut y déceler ce goût pour le confort et l'ambiance « cozy » propre aux intérieurs anglais et un rappel du bel étage de la maison géorgienne (Rybczynski, 1989). Les manteaux de cheminée en marbre sculpté de la maison Morey traduisent sans équivoque la fortune des propriétaires.

L'intérêt sur le plan historique des maisons étudiées est qu'elles ont toutes les deux maintenu pratiquement intactes leurs caractéristiques architecturales. La maison Johnston a l'avantage de n'avoir connu que quatre propriétaires en près de 100 ans d'histoire. En effet, la maison est restée dans la famille Johnston jusqu'en août 1977, date à laquelle la veuve Johnston vend la maison à Jean-Pierre Alix, sociologue et Paule Brodeur Alix, étudiante, tous deux originaires d'Ottawa. La maison passe alors entre les mains de francophones pour y rester jusqu'à aujourd'hui. Cette stabilité des occupants a fait en sorte que très peu de transformations ont été faites au bâtiment original. Mis à part la construction d'un solarium à l'arrière à partir de l'ancien porche et la rénovation de la cuisine et de la salle de bain, toutes les pièces sont demeurées intactes et ont préservé le cachet de l'époque.

La maison Morey a connu une histoire plus mouvementée. Ses premiers propriétaires, les Morey, père, fils et petite-fille, ont conservé la maison jusqu'en 1919. À partir de cette date, elle devient la propriété d'Agnes Emma Webster (née MacManamy) et de Frank Webster qui la conservent jusqu'en 1971 (Registre foncier du Québec). Les deux époux sont issus de deux riches familles de Sherbrooke, les MacManamy qui ont fait fortune dans le commerce de boissons alcoolisées et les Webster, propriétaires d'une fabrique de cigares (Kesteman, 2001, 2002). À la mort de Mme Webster, la maison est vendue à la compagnie Chaillon Export Import. Elle change alors de fonction et sert de bureaux jusqu'au moment où elle est achetée par le couple Rinaldo et Evelyne de Médicis. Ceux-ci lui redonnent sa fonction résidentielle et son prestige d'autrefois. Malgré ses nombreux propriétaires, la maison Morey a préservé l'essentiel de ses plans et de son style architectural. Seule la façade a été modifiée vraisemblablement dans les années vingt par l'ajout d'un portique classique et le remplacement de la galerie.

Styles de maison et maisons de style

Les deux maisons étudiées se rattachent à des styles représentatifs des époques où elles ont été construites. La plus ancienne, la maison Morey, est typique du style Second Empire en vogue chez les classes fortunées au Canada durant le dernier quart du XIXe siècle (Cameron et Wright, 1980). Son toit à la Mansart à croupe brisée concave est garni de trois lucarnes sur la façade avant et de deux sur les côtés du bâtiment. Sous les débords du toit court une large corniche décorée de consoles sculptées et regroupées deux par deux à intervalles réguliers. La façade est symétrique et divisée en trois baies. La lucarne centrale (Figure 9), fortement en saillie, abrite une fenêtre cintrée à guillotine et est entourée d'un gable imposant qui reprend la ligne concave de la toiture et vient marquer l'entrée principale (SHCE, 1978). Le rebord du toit est souligné à l'intérieur par une élégante moulure à denticules que l'on retrouve aussi au-dessus de l'entablement des fenêtres. Le classicisme de la façade aux fenêtres régulières a été renforcé par l'ajout au XX^e siècle d'un portique à fronton triangulaire surmonté d'un balcon, et d'une galerie couverte par un toit à faible pente.

Figure 9 : Lucarne centrale, S. Bernier, 2010

La maison Johnston est plus difficilement classable. Elle s'apparente par sa forme générale aux maisons cubiques que l'on retrouve en grand nombre dans le quartier Nord de Sherbrooke (SHCE, 2001). Son toit à pavillon, sa grande corniche ornée de nombreuses consoles de bois sculptées, ses lucarnes en hémicycle (*eyebrow dormer*, McAlester, 1984) (Figure 10), son asymétrie et la diversité de ses ouvertures reprennent des caractéristiques des maisons victoriennes avoisinantes. On remarque, entre autres, que l'architecte a emprunté le motif dans la brique sous la loggia à deux maisons plus anciennes de styles Queen Ann et néo-Tudor situées sur la même rue.

Figure 10 : Maison Johnston, S. Bernier, 2010

Toutefois, la relative sobriété du bâtiment et son traitement à plat de la façade lui confère une certaine modernité. Le balcon avant formé par un enfoncement dans la façade qui crée une sorte de loggia témoigne de la volonté de l'architecte de contenir le volume de la maison à l'intérieur du cube. Les fenêtres, toutes de dimensions différentes, ne respectent pas l'ordonnancement classique, mais suivent plutôt une logique fonctionnaliste selon laquelle la taille des ouvertures doit s'adapter à la fonction de chacune des pièces.

Du catalogue de plan au dessin d'architecte

On ne connaît pas l'architecte de la maison Morey. L'historiographie de l'architecture nous a appris qu'au XIX^e siècle au Québec, les maisons étaient souvent l'œuvre d'entrepreneurs, de charpentiers ou de maçons qui avaient développé un savoir-faire sur les chantiers (Martin, 1999). Ceux-ci s'inspiraient également des livres d'architecture de Loudon et Downing qui ont connu un grand succès à l'époque en Angleterre et aux États-Unis et qui ont circulé également dans les milieux anglophones du Québec et du Canada (Pigeon, 1982).

Danielle Pigeon pose l'hypothèse de l'influence d'un plan de maison avec « toit à la française » de l'ouvrage *Victorian Cottage Residences* d'Andrew Jackson Downing (Figure 11). On retrouve dans la maison dessinée par Downing le toit mansardé typiquement français avec une lucarne centrale en saillie, un plan rectangulaire sur deux étages et une élévation principale à trois baies. L'organisation intérieure de l'espace avec un escalier central et un hall qui ouvre sur des pièces de chaque côté est similaire. Sans pouvoir dire avec certitude que le dessin de Downing a pu servir de modèle à la maison Morey, on doit convenir que ce type de plan a eu une influence sur l'architecture des Cantons-de-l'Est et du reste du Canada (Cameron et Wright, 1980), aussi bien pour les maisons que les édifices publics. Par exemple, sur la rue Dufferin, l'édifice de la Eastern Townships Bank où travaillait Morey et celui du Bureau des postes et de la douane étaient tout deux d'inspiration Second Empire et construits dans les années 1870 (SHCE, 2001).

Figure 11 : French Roof House, A.J. Downing, Victorian Cottage Residences, 1873.

Le cas de la maison Johnston est différent puisqu'on connaît l'architecte qui en a dessiné les plans. Joseph Wilfred Grégoire (1880–1955) était un architecte actif dans la région et on lui doit plusieurs édifices publics et religieux à Sherbrooke et dans les Cantons-de-l'Est. Il a conçu notamment l'ancien hôtel de ville (1923) sur la rue Wellington, l'Église Saint-Jean-Baptiste (1907–1908) dans l'est de la ville, des maisons privés dont celle, imposante, de Wilfred Légaré (1932) à l'angle des rues Portland et Ontario (*Biographical Dictionary of Architects in Canada*, 1800–1950). Fils d'un forgeron, J.W. Grégoire s'est formé à la pratique de l'architecture dans le bureau de l'architecte Joseph Verret de Sherbrooke auquel il succéda à la mort de celui-ci en 1902 (*La Tribune*, 1955). Au moment où il dessine les plans de la maison Johnston, il a 34 ans et a déjà fait construire quelques églises dans la région.

Ce n'est donc pas à un architecte débutant qu'Hubert B. Johnston confie les plans de sa maison. Tant le propriétaire que l'architecte veulent donner à la maison un caractère unique, une signature, qui la distingue des autres maisons du quartier. C'est ce qui explique certaines particularités que l'on ne retrouve sur aucune autre maison du voisinage telles ses lucarnes en sourcil, ses petites fenêtres en rangée qui rappellent les manoirs anglais, sa loggia ou son foyer à l'étage. C'est aussi la raison pour laquelle il est difficile de l'associer à un seul style, l'architecte ayant emprunté librement au langage architectural de plusieurs styles, concevant ainsi un bâtiment à mi-chemin entre la tradition et la modernité.

Si l'utilisation du bois pour la maison Morey reflète l'influence de l'architecture de la côte est américaine, le choix de la brique rouge pour la maison Johnston fait référence au cottage londonien. L'extérieur de la maison Morey est entièrement recouvert sur les deux étages de bois posé à clin aussi bien pour le pavillon central que les annexes. Malgré une certaine sobriété du travail du bois si on la compare à d'autres maisons de la même époque, la maison Morey offre un bel exemple de l'effet décoratif que permet le bois. Les colonnes cannelées de la galerie, les piliers du portique, les pilastres qui encadrent la porte principale et soulignent l'angle des façades, l'entablement ouvragé, la corniche et les consoles sculptées, tous ces détails contribuent à l'élégance classique du bâtiment.

La maison Johnston possède quelques détails extérieurs en bois dont la corniche et ses consoles, l'auvent au-dessus de la porte principale et une fascia au-dessus de la galerie. Quant à la brique, elle est posée à l'horizontale sauf au-dessus des ouvertures qu'elle souligne par un dessin à la verticale. Sous la loggia, la brique ajourée forme un motif décoratif. Les joints sont fins, en mortier de la même couleur que la brique. Cette sobriété décorative distingue nettement la maison Johnston des maisons victoriennes des décennies précédentes qui multipliaient les matériaux (brique, bois à clin, à bardeaux, pierre) et les éléments architecturaux décoratifs (tourelles, pignons, balustrades).

Valeur patrimoniale

Ni la maison Morey ni la maison Johnston ne sont classées dans le Répertoire des biens culturels du ministère de la Culture, des Communications et de la Condition féminine du Québec. La maison Morey a fait l'objet d'une étude par la Société d'histoire des Cantons de l'Est et fait partie du circuit patrimonial proposé par la SHCE. La maison Johnston n'avait jusqu'ici jamais été répertoriée parmi les œuvres de Joseph Wilfrid Grégoire. L'accès à des archives privées a rendu possible cette authentification.

Les rôles d'évaluation de la Ville de Sherbrooke et du Registre foncier du Québec nous a permis de dater avec certitude la maison Johnston. Construite en 1914, elle est aujourd'hui presque centenaire. Bien que relativement récente, elle possède une certaine valeur d'âge si on replace sa construction dans la courte histoire du Québec. On peut, par ailleurs, attribuer à la maison Morey, qui date des années 1870, une indéniable valeur d'âge d'autant plus qu'elle est située sur une des rues les plus anciennes de la ville. Étant donné le remarquable état de conservation des deux maisons, leur âge réel coïncide avec leur âge apparent, pour reprendre la typologie de Luc Noppen et de Lucie K. Morisset (1997). Leur localisation dans un quartier reconnu patrimonial par la Ville de Sherbrooke contribue à la reconnaissance de l'ancienneté des deux maisons.

Conçue par un architecte, la maison Johnston s'inscrit dans l'ensemble de l'œuvre architecturale de Joseph Wilfrid Grégoire. Le choix de recourir aux services d'un architecte renseigne sur l'intention du propriétaire de doter sa maison d'une valeur esthétique reconnue. Le devis de construction rédigé sur les formulaires à l'en-tête de *The Province of Quebec Association of Architects* ainsi que les dessins originaux des plans et des élévations attestent la valeur architecturale du projet. La maison elle-même, par la recherche stylistique dont elle témoigne, se classe incontestablement du côté des œuvres d'art. Par ses caractéristiques uniques, elle se distingue des autres maisons du quartier. Elle répond ainsi aux critères de rareté et d'unicité qui créent la valeur d'art d'un bâtiment (Nopens et Morisset, 1997).

L'absence de renseignements sur la conception de la maison Morey ne permet pas de lui apposer le sceau d'un architecte connu. Comme nous l'avons mentionné, l'historienne d'art, Danielle Pigeon, laisse entendre que la villa aurait pour source un catalogue de plan très populaire aux États-Unis et au Canada dans les années 1870. On sait que le métier d'architecte était encore peu développé au moment de la construction de la maison. Toutefois, plusieurs maisons à Montréal situées dans le fameux Golden Square Mile ont été dessinées par des architectes réputés (Communauté urbaine de Montréal, 1987). Il demeure donc possible que la maison Morey ait été conçue par un architecte étant donné le réseau de relations qu'entretenait Thomas S. Morey avec la riche société de Montréal et de Toronto. Quoi qu'il en soit, la villa impressionne par l'élégance de sa façade, l'harmonie et la proportion de ses volumes, et la finesse de ses détails. Grâce à son remarquable état de conservation, elle constitue un exemple précieux du style Second Empire au Québec. Symbole de prestige au moment de sa construction, elle demeure encore aujourd'hui d'une beauté toute classique.

Les deux maisons étudiées ont été conçues pour des fins domestiques et servent encore aujourd'hui de résidences unifamiliales. En consultant les rôles d'évaluation de la ville de Sherbrooke, on apprend que la maison Johnston, après avoir été occupée durant les 3 premières années par le couple Johnston, a été louée à différents locataires jusqu'en 1921, date à laquelle les Johnston réintègrent leur maison. Les archives de la ville indiquent alors 4 occupants (vraisemblablement le couple et deux enfants) et un chien.

La maison Morey a été habitée successivement pendant près de cent ans par deux familles : les Morey et les Webster. Durant les années soixante-dix, la maison a changé de vocation et a servi de bureaux à diverses compagnies. En 1975, à la suite de la demande de l'homme d'affaires Frank Taboïka d'apporter d'importantes transformations à la maison, le Conseil de ville émet une résolution à l'effet que le propriétaire limite les travaux de rénovation à l'intérieur de la résidence et conserve le cachet extérieur de la maison (SHCE, 1978). À partir de la fin de l'année 1976, la maison rachetée par les de Médicis retrouve sa vocation originale.

La valeur historique de la maison Morey repose sur ses occupants, principalement le fils du premier propriétaire, Samuel Foote Morey, un personnage important dans les milieux d'affaires et culturel de la ville de Sherbrooke. Inspecteur en chef à la Eastern Townships Bank, celui-ci est un ardent défenseur des arts et de la culture. Samuel F. Morey est connu entre autres pour avoir fondé en 1886, avec un groupe d'anglophones aisés de la ville, la Sherbrooke Library & Art Association, une bibliothèque publique et un centre culturel qui diffuse des expositions, des concerts et des conférences pendant plus de quarante ans (Nadeau Saumier, 2007).

Quant à la maison Johnston, sa valeur historique tient davantage à son architecte, Joseph Wilfrid Grégoire qui, grâce aux nombreuses commandes obtenues de la ville, du gouvernement fédéral et des diocèses catholiques de la région, a contribué à façonner le paysage de Sherbrooke et des Cantons-de-l'Est. Ses œuvres se retrouvent dans plusieurs municipalités de la région. Il a dessiné notamment des plans pour des hôtels de ville (Sherbrooke, Arthabaska), diverses églises (Saint-Jean-Baptiste à Sherbrooke, Sainte-Élisabeth à North Hatley), une succursale de la Banque Royale à Lennoxville, le Bureau de postes de Sherbrooke, des écoles, un couvent, un théâtre et des commerces variés, sans compter les maisons privées.

Conclusion

L'étude des maisons Morey et Johnston est révélatrice de l'évolution d'un quartier, le Vieux Nord de Sherbrooke, des styles architecturaux et de l'habitat dans les Cantons-de-l'Est entre la fin du XIX[e] siècle et le début du XX[e] siècle, et de la naissance de la conception moderne de l'architecte au Québec. Elle vient confirmer l'influence anglo-saxonne, particulièrement américaine, sur l'architecture de la région qui a eu, entre autres, pour véhicules les ouvrages des architectes américains A.J. Downing ou Samuel Sloane (Kalman, 2000) et qui donne à la région son visage unique au Québec.

La maison Morey est un exemple remarquable du style Second Empire très populaire dans le dernier quart du XIX[e] siècle au Québec non seulement dans les zones urbaines, mais même dans les zones rurales où les maisons de ferme se voient coiffées de toits mansardés et de lucarnes (Cameron et Wright, 1980). Ce style qui a notamment marqué l'apparence de Montréal a été adopté autant pour l'architecture domestique que pour les édifices publics, banques, hôtel de ville, les villas cossues ou les triplex. L'effet pittoresque du toit mansardé, les lucarnes et le traitement classique de la façade sont des éléments qui ont contribué à rendre ce style attrayant et populaire (Cameron et Wright, 1980). Compte tenu de son succès en Europe, France et Angleterre surtout, et en Amérique, Cameron et Wright qualifient ce style d'international. Toutefois, les constructeurs québécois et canadiens ont adapté ce style au contexte local, entre autres dans le choix des matériaux. Ainsi, la brique est plus fréquemment utilisée en Ontario tandis que le Québec privilégie la pierre. Le choix du bois pour la maison Morey dénote une influence américaine.

La maison Johnston est également d'influence américaine, mais se rapproche davantage du Four Square américain qui est apparu au Canada autour des années 1910 et qui se caractérise par son plan carré, ses deux étages et son toit à pavillon doté d'une lucarne en façade (Kalman, 2000). Harold Kalman rapproche cette maison de la maison géorgienne du siècle précédent : «It offered the same image of stability as the Georgian house did a century earlier, and provided an alternative – perhaps a reaction – to the picturesque designs of only a few years before» (Kalman, 2000 : 445). Ce modèle de maison compacte a été popularisé entre autres par les compagnies Eaton et Sears Roebuck qui en vendaient les plans par catalogue à des prix accessibles à la classe moyenne. Toutefois, la maison Johnston n'est pas une reproduction fidèle de ce style. Entre autres, elle ne possède pas la véranda à l'avant qui caractérise ce modèle. Celle-ci est plutôt remplacée par un balcon récessif.

Contrairement à la maison Morey qui est très représentative de son style, la maison Johnston se distingue par ses particularités. Sa valeur n'est pas liée tant à son exemplarité qu'à l'expression d'un individu, l'architecte qui en a dessiné les plans. La maison Johnston marque l'apparition de l'architecte moderne perçu comme un artiste qui apporte sa signature personnelle à un bâtiment et qui, par conséquent, distingue également le client qui l'embauche. Ainsi, les maisons Morey et Johnston sont non seulement caractéristiques de styles architecturaux différents, elles témoignent également d'une transformation dans la construction domiciliaire par la participation d'un nouveau joueur qui s'insère entre le client et l'entrepreneur. Bien qu'encore marginale et limitée aux classes relativement aisées, la présence de l'architecte est maintenant une donnée incontournable de l'architecture résidentielle.

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ENDNOTES

1 L'auteure remercie M et Mme de Médicis ainsi qu'Hélène Liard, archiviste à la Société d'histoire de Sherbrooke pour leur précieuse collaboration.

MAIRES, CONSEILLERS ET AUTRES OFFICIERS DU CANTON D'ASCOT, DE LA MUNICIPALITÉ DU CANTON D'ASCOT ET DE LA MUNICIPALITÉ D'ASCOT (1841–2001)

Jean-Marie Dubois et Gérard Coté
Membres du Comité de toponymie de la Ville de Sherbrooke

Résumé
Le dépouillement des procès-verbaux du Township of Ascot (Town of Sherbrooke, 1841–1845), de la municipalité du canton Ascot (1845–1847; 1858–1989), de la municipalité des Townships of Ascot and Westbury (1855–1858) et de la municipalité d'Ascot (1989–2001) a permis de retracer le nom des élus avec les dates de leur mandat, ce qui n'avait jamais été fait jusqu'à maintenant. On n'a cependant pu retracer les procès-verbaux de la municipalité du comté de Sherbrooke (1847–1855). L'objectif était de trouver des noms qui auraient été oubliés dans la toponymie sherbrookoise. On a ainsi pu constater qu'il y a seulement 5 des 39 maires dont la mémoire est rappelée dans la toponymie, 3 des 16 secrétaires-trésoriers, 3 des 92 officiers de canton (tâches diverses, période 1841–1845), 8 des 130 conseillers municipaux et aucun des 16 commissaires d'écoles (période 1842–1845).

Abstract
A close reading of the minutes of the Township of Ascot (Town of Sherbrooke, 1841–1845), of the municipality of the Township of Ascot (1845–1847; 1858–1989), and of the municipalities of the Townships of Ascot and Westbury (1855–1858) has allowed us to identify the names of all elected officials along with the exact dates of their respective mandates, a project that has never yet been undertaken. However, we were unable to locate the minutes of the municipality of Sherbrooke County (1847–1855). The purpose of this project was to identify any names that might have been omitted by the members of Sherbrooke's Toponymy Committee. We were thus able to note that only five of the 39 mayors have been selected by the committee, along with 3 of the 16 secretary-treasurers, 3 of the 92 township officers (playing various roles in the 1841–1845 period), 8 of the 130 councillors and none of the 16 school commissioners (for the 1842–1845 period).

Introduction

En tant que membres du Comité de toponymie de la Ville de Sherbrooke depuis plus de deux décennies maintenant, nous nous occupons autant à rechercher les toponymes les plus judicieux possibles qu'à documenter le sujet de ces toponymes et à écrire des textes justificatifs qui se trouvent ou se trouveront sur le site Internet de la Ville. Présentement, on peut y consulter plus de 1 200 fiches descriptives d'autant de noms de rue : (*http://www.ville.sherbrooke.qc.ca/webconcepteur/web/VilledeSherbrooke/fr/vivre/nav/fiches.html?iddoc=122443*). Ainsi, nous sommes toujours à l'affût de renseignements sur le monde municipal, principalement les élus de Sherbrooke et des municipalités fusionnées avec Sherbrooke en 2002. Entre autres, il arrive souvent que nous manquions de certitude sur la période exacte où un élu a été maire ou conseiller municipal, les dates variant parfois en fonction des écrits, et cela quand nous retrouvons l'information. C'est ainsi que nous est venue l'idée d'aller aux sources de l'information, soit les procès-verbaux des conseils municipaux. Dans le cas du canton d'Ascot, aucune liste des élus n'existe, sauf des listes très partielles. La présente contribution est ainsi tout à fait inédite.

Le contexte historique

L'autorisation d'arpentage du canton d'Ascot est émise le 20 juin 1792 par le Comité des terres du Bas-Canada. Le canton commence à être défriché par des colons sous la direction de Gilbert Hyatt (*leader*) en 1793. Toutefois, le Township of Ascot n'est proclamé et concédé à Gilbert Hyatt que le 3 mars 1803.

Le 15 avril 1841, le régime des municipalités de district est décrété pour l'ensemble du Québec. La majeure partie des Cantons-de-l'Est, dont le canton d'Ascot, ne forme alors qu'une seule municipalité de district, celle de la Town of Sherbrooke, dont le préfet (*warden*) est Edward Hale. De 1841 à 1845, on tient une réunion générale en début d'année pour élire les officiers qui se partagent les tâches (*councillors, assessors, surveyors, collectors, poundkeepers, overseers of the poor* et *overseers of highways, fence viewers and inspectors of drains*). De 1842 à 1845, on élit aussi les commissaires d'école (*school commissioners*).

Le 1er juillet 1845, le canton est municipalisé sous le nom de municipalité du Township of Ascot (qui inclut le Township of Orford, peu peuplé à l'époque). La première réunion du conseil municipal se tient le 21 juillet 1845 et la dernière le 26 août 1847. On élit le premier maire et c'est le conseil municipal qui choisit les personnes pour les tâches collectives.

Du 1er septembre 1847 au 1er juillet 1855, le canton d'Ascot fait désormais partie de la municipalité du comté de Sherbrooke, qui comprend tout le territoire des futurs comtés de Compton, Richmond, Sherbrooke et Wolfe. Les maires sont Hollis Smith (1847–1851), A. G. Woodward (1851–1852) et Charles Brooks (1853–1855), tandis que le secrétaire-trésorier est Joseph Gibb Robertson. Des 18 conseillers, deux sont élus par le canton d'Ascot : William Locker Pickmore Felton et Charles Brooks.

Le canton d'Ascot devient une municipalité distincte en 1855 puis devient la municipalité des Townships of Ascot and Westbury en 1855 (la première réunion du conseil dont le procès-verbal a été conservé est celle du 6 août 1855 et la dernière, celle du 4 octobre 1858). Il redevient ensuite la municipalité du Township of Ascot (du canton d'Ascot) en décembre 1858 (première réunion du conseil le 6 décembre 1858). Enfin, il devient la municipalité d'Ascot le 1er avril 1989 et il se fusionne avec Sherbrooke le 1er janvier 2002.

Une seule photographie d'un conseil municipal a été retrouvée, soit celle de 1987.

Conseil municipal d'Ascot, novembre 1987
(Photo : *Inform-Ascot*, vol. 1, no 5, décembre 1987, p. 1)

Alors que le canton d'Ascot est une entité territoriale pérenne, en termes de municipalité, le territoire du canton d'Ascot s'amenuise avec le temps : Sherbrooke s'en sépare le 28 juin 1852, Lennoxville le 1er janvier 1871, Ascot Corner le 28 mars 1901, Rock Forest (partie est) le 21 mars 1921 et Ascot-Nord (Fleurimont) le 7 août 1937. Certains secteurs du canton sont annexés par Sherbrooke en 1942 et 1948 et le secteur de l'Université de Sherbrooke en 1968. Enfin, de 1994 à 1997, le canton a perdu une partie de son territoire au profit du canton d'Eaton et des municipalités de Hatley, Lennoxville et Waterville.

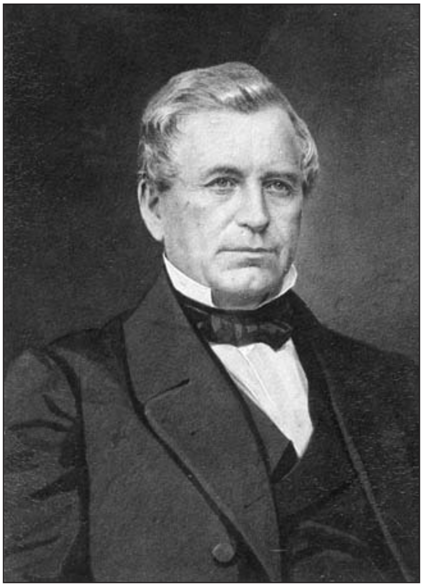
Les listes des maires, secrétaires-trésoriers, officiers, commissaires d'école et conseillers municipaux qui suivent sont présentées par ordre chronologique de la première année d'entrée en fonction des élus, puis en fonction de la durée de leur implication.

Les présidents d'assemblée et les maires (1841–1847 ; 1855–2001)
Il y a eu un président d'assemblée (*chairman*) du canton d'Ascot de 1841 à 1845 et 39 maires entre 1845 et 2001. De 1841 à 1953, des élections annuelles se tiennent en début d'année. Au commencement, les présidents d'assemblée puis les maires peuvent demeurer à leur poste plusieurs années mais, à partir de 1900, on s'aperçoit que ce n'est plus le cas. On se retrouve donc avec une pléthore de maires qui demeurent rarement plus d'un an en poste. À partir de 1953, les élections se tiennent aux quatre ans, en été et plus tard, en novembre. Les maires qui sont demeurés le plus longtemps en poste sont Robert Y. Pouliot (22 ans) et Benjamin J. Morris (14 ans).

Smith, Hollis (*chairman*) (1841–1845)
Ritchie, William (1845–1847)

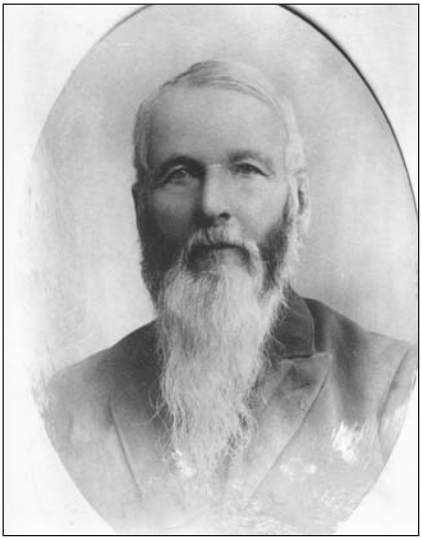
1847–1855 (municipalité du comté de Sherbrooke)
Brooks, Charles (1855–1865; 1870)
Stevens, Artemas (1866–1869)
Oughtred, Robinson (1871)
Morris, Benjamin T. (1872–1886)
Gamsby, John Wilkins (1886–1887)
Lyster, James (1887)
Tyler, Robert H. (1887–1891)
McCurdy, David (1891–1892)
Morris, William (1893–1900)
Armitage, Walter S. (1901; 1907)
Mitchell, Robert (1902; 1908–1910)
Marlin, James S. (1903–1904 ; 1916)
Hétu, Pierre (1904–1905)
Duford, John B. (1905)
O'Connor, James (1906; 1913 ; 1917–1918)
McCurdy, George G. (1911–1912)
Bourque, Eugène Antonin Côme (1914–1915)
Nichol, John (1919–1920)
Orr, Edgar A. (1921–1922; 1940; 1947–1951)

Mailhot, André (1923–1924)
Collins, Richard F. (1925–1926)
Raby, Théophile A. (1927–1928)
Ashe, Robert (1929–1930)
Lemire, J. Emmanuel (1931–1932)
Paige, James L. (1933–1934)
Woodside, J. Henry (1935–1936)
Plante, Joseph Rosario (1937)
Nutbrown, J. Earle (1937–1939)
Ross, Hitton R. (1941–1942)
Smith, William H. A. (1942–1944)
McCurdy, Wilbur J. (1945–1946)
Clément, Léopold (1951–1952)
Nichol, Wesley W. I. (1953–1957)
Lynch, Edward J. G. (1957–1963; 1977–1979)
Fearon, George Delmer (1963–1973)
St-Jacques, Eugène (1973–1975)
Rancourt, Réal (1976–1977)
Pouliot, Robert Y. (1979–2001)



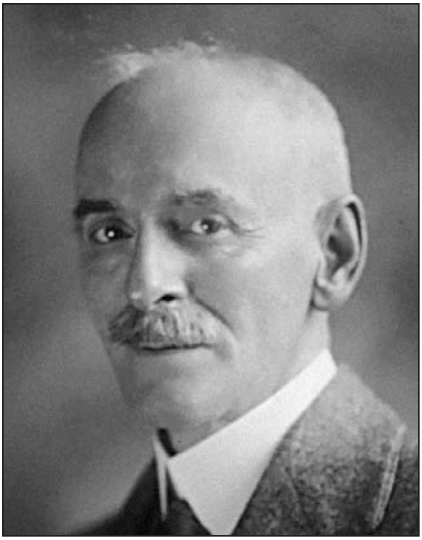
Hollis Smith (chairman 1841–1844) (Fonds de la Stanstead and Sherbrooke Mutual Fire Insurance Co., La Société d'histoire de Sherbrooke IP139 PN 41A 25 3054, années 1900)

William Ritchie (1845–1847) (Fonds de la Stanstead and Sherbrooke Mutual Fire Insurance Co., La Société d'histoire de Sherbrooke IP139 PN 41A 29 3058)



Charles Brooks (1855–1865 ; 1870) (Photo : François Lafrance, reproduction de 1880, Collection de la Société d'histoire de Sherbrooke)

Benjamin T. Morris (1872–1886) (Fonds de la Stanstead and Sherbrooke Mutual Fire Insurance Co., La Société d'histoire de Sherbrooke IP139 PN 41A 24 3053, années 1880)



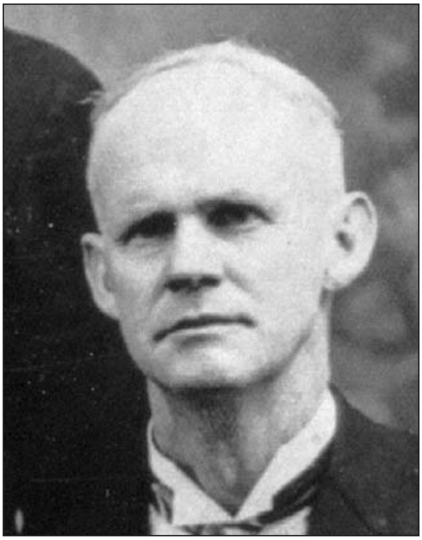
William Morris (1893–1900) (Rue Morris : Fonds de la Stanstead and Sherbrooke Mutual Fire Insurance Co., La Société d'histoire de Sherbrooke, La Société d'histoire de Sherbrooke IS4 PN 41A 369)

Robert Mitchell (1902; 1908–1910) (Chemin Mitchell ; photo : Pierce, Erastus G. (1917) Men of Today in the Eastern Townships. Sherbrooke Record Company, Sherbrooke, 1917, p. 228)

Eugène Antoine-Côme Bourque (1914–1915) (Fonds John S. Bourque, La Société d'histoire de Sherbrooke, détail d'une photo de 1947)

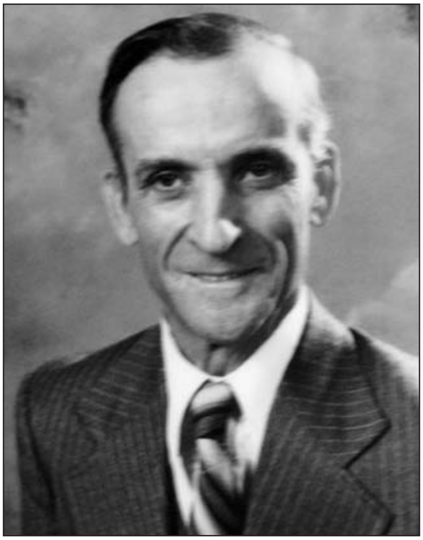
John Nicol (1919–1920) (Photo : François Lafrance, reproduction de 1880, Collection de la Société d'histoire de Sherbrooke)

Théophile A. Raby (1927–1928) (Photo : Collection de Gilberte Raby. Sherbrooke)

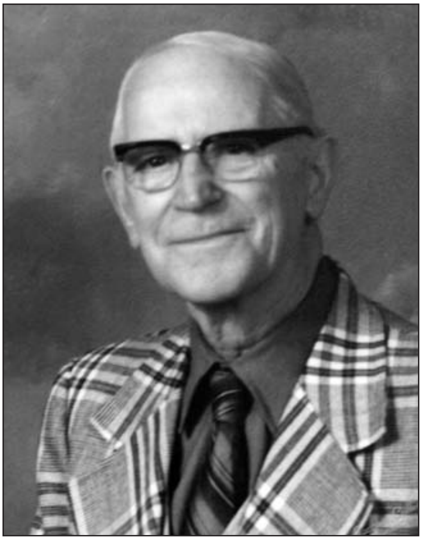


J. Emmanuel Lemire (1931–1932) (Chemin Lemire; photo : Labrecque, Nicole et Labrecque, Roger (2000) Ville de Fleurimont. Toponymie et événements majeurs. 1937–2000. Ville de Fleurimont, Sherbrooke, p. 15)

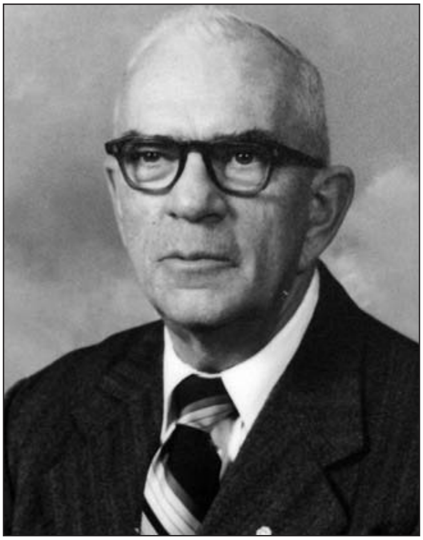
Joseph Rosario Plante (1937) (Chemin Plante; photo : Société d'histoire de Sherbrooke)



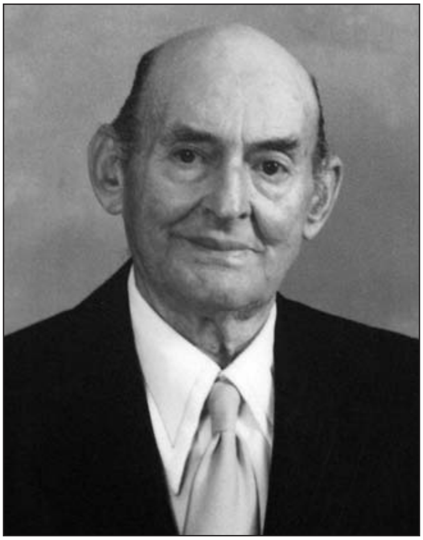
Léopold Clément, (1951–1952) (Photo : Bureau de l'arrondissement du Mont-Bellevue)



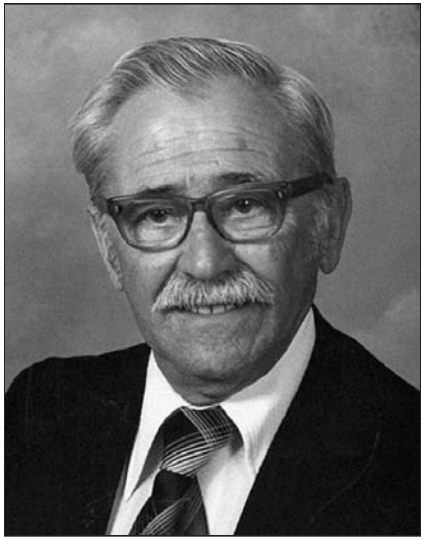
Wesley W. I. Nichol (1953–1957) (Photo : Bureau de l'arrondissement du Mont-Bellevue)



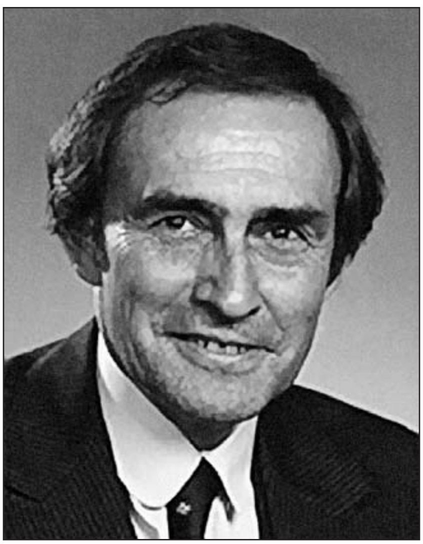
Edward J. G. Lynch (1957–1963 ; 1977–1979) (Photo : Bureau de l'arrondissement du Mont-Bellevue)



George Delmer Fearon (1963–1973) (Photo : Bureau de l'arrondissement du Mont-Bellevue)



Eugène St-Jacques (1973–1975) (Rue Eugène-St-Jacques; photo : Maurice St-Jacques. Sherbrooke)



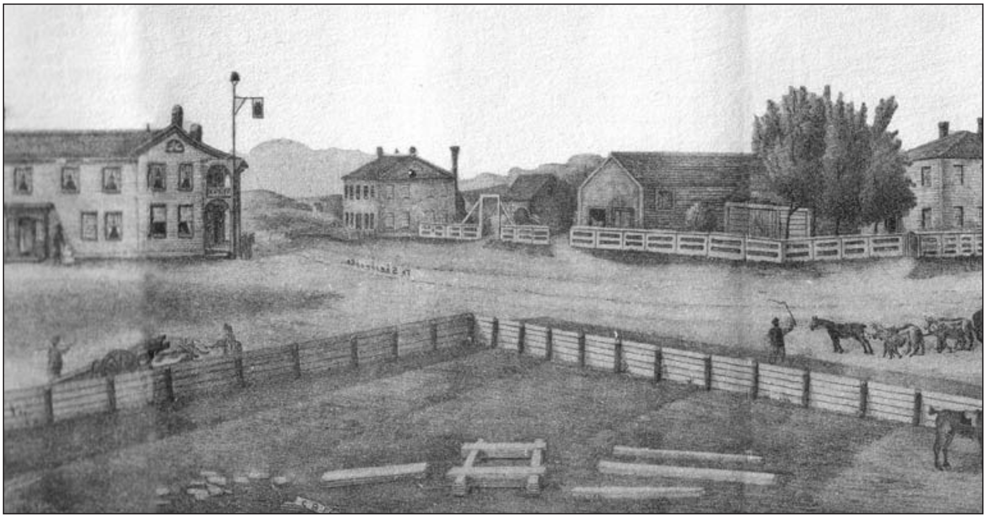
Réal Rancourt (1976–1977) (Photo : Assemblée nationale du Québec)

Robert Y. Pouliot (1979–2001) (Photo : Bureau de l'arrondissement du Mont-Bellevue)

Les secrétaires-trésoriers (1843–1847 ; 1855–2001)
Il y a eu seulement deux secrétaires (*township clerk*) puis 14 secrétaires-trésoriers entre 1843 et 2001. Les mandats sont de longueur très variable, mais ceux qui ont fait la plus longue carrière sont William Wayman Baker (57 ans) et Ralph A. Broadhurst (27 ans).

Richardson, Charles Anderson (1843–1844) *(township clerk)*
Bennett, John *(township clerk)*
Walton, Joseph Soper (1845–1847)

1847–1855 (municipalité du comté de Sherbrooke)
Abbott, Ephrem W. (1855–1865)
Towle, Charles Edward (1865–1872)
Hart, R.M. (1872–1882)
Stevens, Artemas W. (1882–1891)
Baker, William Wayman (1891–1947)
Broadhurst, Ralph A. (1947–1974)
Auger, Pierre (1974, temporaire)
Drouin, Arthur (1974–1985)
Tremblay, Jean (1985–1988)
Pérusse Groleau, Diane (1988–1989)
Martin, Debra J. (1988, 1989 : adjointe)
Boily, Mario (1990–1998)
Gamache, Alain (1998–2000)
Assselin, Diane (2000–2001)

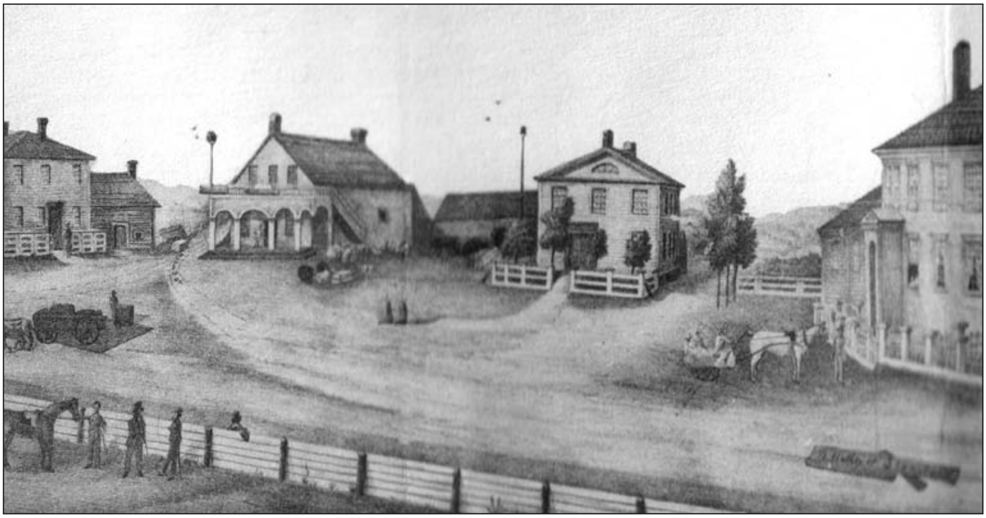


Au premier plan, l'enclos pour animaux perdus ou errants (*pound*) de Lennoxville à l'intersection des actuelles rues Queen et College; le bâtiment à gauche avec le mat de drapeau est l'auberge Warren sur le

Les officiers du canton (1841–1845)

Avant la municipalisation, le partage des tâches communes pour le bon fonctionnement du canton s'effectue en début de chacune des années. En moins de cinq ans, 92 personnes s'en sont acquittées. Annuellement, on retrouve de 15 à 22 surveillants des routes, des ponts et de l'aménagement de leurs abords (*overseers of highways, fence viewers and inspectors of drains*), quatre à cinq arpenteurs (*surveyors*), deux gardiens d'enclos des animaux perdus ou errants (*pound keepers*), deux évaluateurs fonciers (*assessors*) (sauf en 1842), un ou deux « surveillants » des pauvres (*overseers of the poor*) ainsi qu'un ou deux conseillers (*councillors*) qui représentent le canton à la municipalité de district. On ne trouve qu'un percepteur de taxes (*collector*) en 1841 et en 1845.

Spafford, Tyler Junior (*councillor*: 1841–1843)
Burns, Thomas (*overseer of highways*: 1841)
Clark, Eleazar (*collector*: 1841)
Finnie, James Boyd (*overseer of highways*: 1841)
Warren, William Elijah (*pound keeper*: 1841)
Wright, Jason (*overseer of highways*: 1841)
Aldrich, Elisha (*overseer of highways*: 1841–1842)
Gordon, Lieutenant Thomas (*surveyor*: 1841–184?)
Hall, Zaccheus (*overseer of highways*: 1841–1842)
Moe, Hiram (*overseer of highways*: 1841; *surveyor*: 1842)
Pease, Anthony (*overseer of highways*: 1841–1842)
Thompson, Alexander (*overseer of highways*: 1841–1842)



site de l'actuelle bibliothèque. (Dessin de C.B. Felton en 1832, dans de Volpi, C.P. and Scowen, P.H., 1962, *The Eastern Townships : A pictoral record.* DEV-SCO Publications, Montréal, plate 2)

Gamsby, John (*overseer of highways*: 1841, 1843)
Mallory, Mitchell (*overseer of highways*: 1841, 1843)
Mallory, Samuel (*assessor*: 1841, 1843)
Belknap, William (*surveyor*: 1841–1842, 1844)
Blodgett, Oliver (*overseer of highways*: 1841; *collector*: 1842–1844)
Ball, L. C. (*assessor*: 1841, 1843; *councillor*: 1844–1845)
Warner, Elam Junior (*overseer of highways*: 1841, 1844)
Barrie, James (*overseer of highways*: 1841; *pound keeper*: 1842; *assessor*: 1845)
Bullards, Luther (*surveyor*: 1841–1842, 1845)
Hunting, Seth (*overseer of highways*: 1841, 1843, 1845)
Johnston, John (*overseer of highways*: 1841, 1843–1844; *assessor*: 1845)
Jones, William (*overseer of highways*: 1841, 1843; *surveyor*: 1845)
Lloyd, Captain William (*overseer of the poor*: 1841, 1842, 1845)
Stockwell, Isaac (*pound keeper*: 1841–1842, 1845)
Towle, Captain Charles E. (*assessor*: 1841, 1843; *surveyor*: 1845)
Bradley, Eli B. (*overseer of highways*: 1842)
Dundon, James (*overseer of highways*: 1842)
Farwell, Orlen (*overseer of highways*: 1842)
Libbey, Christopher C. (*overseer of highways*: 1842)
Reynolds, John C. (*overseer of highways*: 1842)
Stevens, Gardner (*overseer of highways*: 1842)
Wilson, Dr William (*surveyor*: 1842; *councillor*: 1841, 1844)
Wood, George (*overseer of highways*: 1842)
Winslow, Samuel (*overseer of highways*: 1842)
McCurdy, James (*overseer of highways*: 1842–1844)
Moulton, James W. (*overseer of highways*: 1842, 1845; *surveyor*: 1843)
Bailey, Joseph (*overseer of highways*: 1843)
Beaulieu, Mark (*overseer of highways*: 1843)
Brooks, George W. (*surveyor*: 1843; *councillor*: 1844)
Burke, John (*overseer of highways*: 1843)
Edgell, Horace A. (*overseer of highways*: 1843)
Elliott, William (*overseer of highways*: 1843)
Fuller, Lewis (*overseer of highways and pound keeper*: 1843)
McDougall, Alexander (*overseer of highways*: 1843)
Norton, V. (*overseer of highways and pound keeper*: 1843)
Ryther, James (*overseer of highways*: 1843)
Woodworth, Perry (*overseer of highways*: 1843)
Fraser, John (*overseer of the poor*: 1843–1844)
Walker, William (*surveyor*: 1843–1844)

Morris, Colonel William (*overseer of highways*: 1843–1844; *overseer of the poor*: 1843–1845) (personne différente du maire et du conseiller Morris)
Ball, David (*overseer of highways*: 1844)
Brooks, Charles (*surveyor*: 1844)
Burke, Paul (*overseer of highways*: 1844)
Cheney, Elias (*overseer of highways*: 1844)
Cousiner, George (*overseer of highways*: 1844)
Drummond, Hepburn (*overseer of highways*: 1844)
Hyatt, Joseph (*overseer of highways*: 1844)
Jackson, George (*overseer of highways*: 1844)
Kenaston, J. (*pound keeper*: 1844)
Loomis, Warren (*surveyor*: 1844)
McCurdy, George (*overseer of highways*: 1844)
Morris, Benjamin (*overseer of highways*: 1844)
Rofs, Hardock (*overseer of highways*: 1844)
Scott, James (*pound keeper*: 1844)
Soel, John (*overseer of highways*: 1844)
Stevens, Gardner (*assessor*: 1844)
Stone, Phinehas (*assessor*: 1844)
Widger, Richard (*overseer of highways*: 1844)
Wiggett, Anthony (*overseer of highways*: 1844)
Windman, Robert (*overseer of highways*: 1844)
Winslow, Daniel (*overseer of highways*: 1844)
Caron, Gabriel (*overseer of highways*: 1844; *assessor*: 1845)
Dodds, William (*overseer of highways*: 1844–1845)
Webster, Horace (*assessor*: 1844; *collector and pound keeper*: 1845)
Barns, Edward (*overseer of highways*: 1845)
Brown, William (*overseer of highways*: 1845)
Camirand, Olivier (*overseer of highways*: 1845)
Chambers, John P. (*overseer of highways*: 1845)
Fitzgerald, Andrew (*overseer of highways*: 1845)
Johnston, James (*overseer of highways*: 1845)
Mitchell, William (*overseer of highways*: 1845)
Morrison, Patrick (*overseer of highways*: 1845)
Parker, James (*overseer of highways*: 1845)
Pease, Rufus (*overseer of highways*: 1845)
Riddell, John (*pound keeper*: 1845)
Robertson, Joseph (*surveyor*: 1845)
Spafford, P. (*overseer of highways*: 1845)
Warner, Joseph (*overseer of highways*: 1845)
Windman, Tyler (*overseer of highways*: 1845)
Winston, Samuel (*overseer of highways*: 1845)

Les commissaires d'école (1842–1845)

Avant la création, en 1845, de la School Municipality of Ascot (ou Ascot School Board) avec la municipalisation du canton, l'assemblée générale du canton élit des commissaires pour gérer les écoles. Ainsi, de 1842 à 1845, 16 personnes se sont partagé la tâche, soit de quatre à sept par année. La première année, on y trouve plusieurs ecclésiastiques.

Donahue, John L. (1842)
Doolittle, Reverend Lucius (1842)
Robertson, Reverend James (1842)
Spafford, Tyler Junior (1842)
Wilson, Dr William (1842–1843)
Lloyd, Captain William (1842–1844)
Harkins, Reverend (1842)
Felton, William Locker Pickmore (1843)
Webster, W. (1843)
Arms, William (1843–1845)
Edgell, Horace A. (1844)
Mallory, Mitchell (1844)
Brooks, George W. (1844–1845)
Addie, George (1845)
Blodgett, G. (1845)
Brooks, Charles (1845)

Les conseillers municipaux (1845–1847; 1855–2001)

Il y a eu 130 conseillers municipaux de 1845 à 2001. Ils sont soumis aux mêmes conditions électives que celles mentionnées plus haut pour les maires. Plusieurs conseillers sont demeurés en poste plus de 15 ans : Robert Mitchell (29 ans), David McCurdy (25 ans), Samuel A. McFadden (23 ans) et Pierre Hétu (20 ans).

Spafford, Tyler Junior (1845–1846)
Ball, Lespnard C. (1845–1847)
Hunting, William (1845–1847)
Wilson, William (1845–1847; 1855–1859)
Brooks, William (1845, 1855)
Beckett, Henry (1845–1846)
Griffith, John (1846–1847)
Felton, William Locker (1846–1847, 1870–1874)
Mallory, Aaron B. (1855–1858)
Ryther, James (1855–1858)
Webster, Horace (1855–1861)
Stevens, Artemus W. (1855–1863, 1866–1868)
Hyatt, Abram C. (1855–1861, 1878–1883)

Caron, Gabriel (1858–1861, 1870)
Winslow, Daniel (1859–1863, 1866–1868, 1875–1878)
True, Gershom W. (1860–1863, 1866–1869, 1874–1879)
Capel, George B. (1862–1863)
Wilson, John H. (1862–1865, 1873–1874)
Ball, Albert Philips (1862–1865, 1870–1877)
Hunting, Henry W. (1864–1870)
Morris, Benjamin J. (1864–1866, 1868–1869, 1872)
Winslow, John H. (1864–1868, 1872–1874)
Dean, Edward R. (1864–1865, 1870–1874, 1877–1883, 1886)
McCurdy, David (1864–1869, 1871–1891)
Bloomey, Benjamin (1866–1869)
Chamberlain, Wright (1867–1868)
Elkins, Henry A. (1868–1872, 1878–1879)
Oughtred, Robinson (1870–1874)
Biron, Joseph Gabriel (1871)
Gamsby, John Wilkins (1875–1886)
Bourque, Norbert (1879–1882)
McFadden, Samuel A. (1879–1902)
Allard, Joseph (1882–1896)
Mitchell, Robert (1884–1908, 1911–1916)
Lyster, James (1886–1887)
Cillis, James (1886–1891)
Tylee, Robert H. (1887)
Fitzgerald, Edward (1888–1891)
Burrill, Simon (1892)
Morris, William (1892)
Cleveland, George B. (1892–1899)
Kenrick, Charles C. (1893–1894)
Luc, Louis (1893–1895)
Hétu, Pierre (1896–1916)
Armitage, Walter S. (1896–1906, 1908–1916)
Duford, John B. (1897–1911)
Marlin, James S. (1901–1902, 1905–1916)
O'Connor, James (1901–1912, 1915, 1919–1923)
Robinson, Angus (1903–1905)
McCurdy, George G. (1906–1910, 1913–1916)
Bourque, Eugène Antoine Côme (1912–1914, 1916)
Nichol, John (1916–1918, 1921)
Ward, Arthur (1917)
Ducker, Edwin (1917–1919)
Bradley, Albert W. (1917–1920)
Jardine, Samuel (1917, 1921)

Mailhot, André (1917–1922)
Orr, Edgar A. (1917–1920, 1930–1939, 1945–1947)
Collins, Richard F. (1918–1924, 1927–1929)
Raby, Théophile A. (1920–1926, 1929–1937)
Ashe, Robert H. (1921–1929)
Loomis, William G. (1922–1929)
Hunting, William S. (1923–1929)
Barrett, William J. (1924–1925)
Lemire, Emmanuel J. (1925–1930)
Paige, James L. (1926–1932, 1935–1938)
Magnan, George H. (1929–1931)
Peck, Thomas (1929–1931)
Nutbrown, Jason Earle (1931–1937)
Woodside, James Henry (1931–1934, 1937–1940)
Plante, Joseph Rosario (1932–1937)
Smith, William H. A. (1934–1942, 1945–1947)
Ross, Hilton R. (1938–1940)
Lacharité, William (1938–1945)
McCurdy, Wilbur J. (1939–1944)
Ingham, Benjamin S. (1940–1947)
Henderson, Walter A. (1941–1942)
Hopper, Samuel A. (1941–1944)
Mitchell, William S. (1942–1945, 1950–1951)
Beattie, W. Johnson (1943–1944)
Green, Roderick W. W. (1945–1947)
Cox, Ernest R. (1945–1949)
Clément, Léopold (1945–1950)
Pearson, William T. (1947–1948)
Woodside, Robert H. (1947–1949)
Nichol, Wesley W. J. (1947–1953)
Hamilton, Joseph (1947–1962)
Fearon, George Delmer (1949–1962)
Rancourt, Louis Ernest (1950–1957)
Bowers, Norman William (1951–1956)
Lynch, Edward J. G. (1951–1956)
Clément, J. Raymond (1955–1961)
Bureau, Louis (1957–1961)
MacDonald, George Morris (1957–1974)
Jacques, Lionel (1958–1963)
Couture, Hubert (1962–1963)
Rancourt, Réal (1962–1975)
Cox, Walter (1963–1966)
St-Jacques, Eugène (1963–1973)

Campbell, John A. (1964–1965)
Chapman, Garrett (1964–1965)
Barron, Allan (1964–1974)
Hunting, Clifford H. (1966–1974)
Webster, Byrl E. (1967–1971)
Cox, Alan (1972–1979)
Gosselin, Monique (1973–1975)
Lafond, Ronald (1973–1975)
St-Onge, Archie (1974–1979)
Clément, Robert (1974–1983)
Sanborn, Arthur (1976–1979)
Beaulieu, Henri-Louis (1976–1983)
Fournier, Gérard (1976–1983)
Bell, William R. (1979–1983)
Hallée, Fernand (1979–1983)
Lafontaine, Denis (1979–1983)
Chenard, André (1983–1986)
Guilbault, Maurice (1983–1986)
Flipot, Paul (1983–1987)
Beaulieu, Michel (1983–1991)
Landry, Jean-Guy (1983–1994)
Cyr, Marcel (1983–1999)
Roy, Raymond (1987–1991)
Gagné, Robert (1987–1991, 1995–1996)
Labbé, Roger (1987–2001)
Downey, Lewis A. (1991–1995)
Bonsant, France (1991–1999)
Demers, Denis (1991–2001)
Houle, Bernard (1995–1996)
Charest, Claude (1999–2001)
Perron, Maurice (1999–2001)

Rappel de la mémoire des élus dans la toponymie sherbrookoise

Il n'y a que cinq maires dont la mémoire est rappelée :

- William Morris (1893–1900) : Rue Morris (secteur de Sherbrooke);
- Robert Mitchell (1902) : Chemin Mitchell (secteur de Lennoxville);
- J. Emmanuel Lemire (1931–1932) : Chemin Lemire (secteur de Fleurimont);
- Joseph Rosario Plante (1937) : Chemin Plante (secteur de Fleurimont);
- Eugène St-Jacques (1973–1975) : Rue Eugène-St-Jacques (secteur d'Ascot).

Il n'y a que trois secrétaires-trésoriers dont la mémoire est rappelée :

- Joseph Soper Walton (1845–1847) : Rue Walton (secteur de Sherbrooke);
- Ephrem W. Abbott (1855–1865) : Rue Abbott (pour famille Abbott) (secteur de Lennoxville);
- William Wayman Baker (1891–1947) : Rue Baker (secteur de Lennoxville).

Il n'y a que trois officiers du canton, nommés entre 1841 et 1845, dont la mémoire est rappelée :

- William Dodds (*overseer of highways*, 1844–1845) : Ruisseau Dodds (secteur de Rock Forest);
- Joseph Robertson (*surveyor*, 1845) : Rue Joseph-Robertson (secteur de Sherbrooke);
- William Elijah Warren (*pound keeper*, 1841) : Rue Warren (secteur de Lennoxville).

La toponymie sherbrookoise ne rappelle la mémoire d'aucun des commissaires d'école de la période de 1842 à 1845.

Enfin, il n'y a que huit conseillers municipaux dont la mémoire est rappelée. La moitié d'entre eux sont des maires déjà mentionnés (William Morris, Emmanuel J. Lemire, Joseph R. Plante et Eugène St-Jacques). Les autres sont :

- Albert Philips Ball (1862–1865; 1870–1877) : Rue Ball (secteur de Sherbrooke);
- Henry Beckett (1846) : Rue et Place Beckett ainsi que Parc du Bois-Beckett (secteur de Sherbrooke);
- John Griffith (1846–1847) : Rue John-Griffith (secteur de Sherbrooke);
- Louis Luc (1893–1895) : Parc Louis-Luc (secteur de Fleurimont).

N.B. La Commission de toponymie du Québec emploie le générique « secteur » pour désigner le territoire d'anciennes municipalités.

On peut constater que, sauf de rares exceptions, le fait qu'on ait retenu le nom d'une des personnes mentionnées plus haut dans la toponymie sherbrookoise n'a pas de lien avec la durée pendant laquelle elle a été au service de la population. Par ailleurs, avec cette recherche nous avons ainsi relevé le nom de nombreuses personnes dont on pourrait tenir compte dans les prochaines années.

SOURCES D'INFORMATION ET REMERCIEMENTS

La recherche a été faite à partir du dépouillement des procès-verbaux des réunions annuelles du canton d'Ascot, de celles du conseil municipal du canton d'Ascot puis de celles du conseil municipal d'Ascot et ce, entre 1841 et 2001. Ces documents sont conservés pour la Ville de Sherbrooke chez Archivexpert, sur la rue Frontenac. Entre 1847 et le 18 août 1855, les procès-verbaux de la municipalité du comté de Sherbrooke, s'il y en a eu, sont introuvables, et ce jusqu'en 1871. Certains renseignements au sujet du contexte historique ont été puisés dans les publications suivantes :

Channell, Leonard Stewart (1896) *History of Compton County: and sketches of the Eastern Townships, District of St. Francis and Sherbrooke County, supplemented with the records of four hundred families, two hundred illustrations of buildings and leading citizens in the county*. À compte d'auteur, Cookshire, p. 31, 47–48.

Kesteman, Jean-Pierre (1984) *Les débuts du canton d'Ascot et de la ville de Sherbrooke (1792–1818). Étude critique*. Département d'histoire, Université de Sherbrooke, Bulletin de recherche n° 1, 24 p.

Kesteman, Jean-Pierre (2000) *Histoire de Sherbrooke ; Tome 1 : de l'âge de l'eau à l'ère de la vapeur (1802–1866)*. Éditions GGC, Sherbrooke, p. 254–260.

Enfin, nous tenons à remercier les personnes suivantes : Jean-Pierre Kesteman (historien régional) et Lillian Rider (Société d'histoire et de musée de Lennoxville-Ascot), qui ont grandement aidé à améliorer le texte.

THROUGH THE LOOKING GLASS: ONE HUNDRED YEARS OF WOMEN'S HISTORY IN THE EASTERN TOWNSHIPS

Chloë Southam
Museologist

In 2009–2010, the Eastern Townships Resource Centre (ETRC) created a virtual exhibition entitled "Through the Looking Glass: One Hundred Years of Women's History in the Eastern Townships." This exhibition, accessible online, is an account of the history, ideas and actions of three fascinating women's groups based in the Eastern Townships. The virtual exhibition was made possible thanks to funding from the Canadian Heritage Information Network and the Virtual Museum of Canada. The Virtual Museum of Canada (VMC) Community Memories Program "is designed to stimulate partnership between museums and their communities in the development of online local history exhibits."[1] "Through the Looking Glass: One Hundred Years of Women's History in the Eastern Townships" sheds some light on the evolution of the roles women have played over the past century in our community; it highlights how women in the Eastern Townships have grouped together to share their knowledge, resources and energy to serve important causes both locally and internationally.

Project development

While researching possible topics for an exhibition using ETRC material, the role of women's groups in the development of this vibrant region emerged as being a particularly interesting and as yet almost unexplored theme. The ETRC's recent restructuring of its mission as a more community-centered cultural organization made it particularly relevant that a proposal should be submitted to the Community Memories programme of Virtual Museum Canada (VMC). The subject of the heritage of women's groups in the Eastern Townships appeared to be an excellent subject for such a collaboration.

In our day and age, it is vital that we come to understand that an archive is not simply a repository for the preservation of documents. Archives must be seen above all as places for the transfer and dissemination of knowledge. It was with a sense of the need to demonstrate the potential of this principle of the 'availability of knowledge' on a local and national level that an exhibition project based on ETRC archival material was developed. The partnership with the 'Community Memories' programme of the Virtual Museum of Canada immeasurably facilitated the achievement of this objective.

The virtual exhibition "Through the Looking Glass: One Hundred Years of Women's History in the Eastern Townships" is not primarily aimed at presenting a historical account of these organizations, but rather at giving the community access to the voices of women's organizations so that its members can become better acquainted with them. The virtual exhibition is an opportunity for visitors to learn and understand how women's organizations have, over the last hundred years, contributed to the well-being of the communities they serve. It explores the separate identities and practices of three distinct women's groups as well as their impact on the well-being of the community.

Three striking women's groups

This exhibition is dedicated to three women's groups: the Women's Institute (WI), the Canadian Federation of University Women of Sherbrooke and District (CFUWSD), and the Lennoxville and District Women's Centre (LDWC). The viewer is given the opportunity to appreciate the differences that distinguish these three groups from one

Figure 1 (P008) Brompton Road Women's Institute

another in terms of transmission and means of action. At the same time it becomes clear that they share or have shared common values and a common aim in promoting solidarity through learning and collective creativity.

This year is the one hundredth anniversary of the presence of the Women's Institute in the province of Quebec. It is also an Eastern Townships anniversary since the first branch to open in the province did so in the Eastern Townships village of Dunham in 1911. The Women's Institute was founded by Adelaide Hoodless in Stony Creek, Ontario in 1897. Over the years, the organization has grown not only regionally but also nationally and internationally. This women's movement played an extremely important role in the improvement of education and health, particularly in rural areas, as well as in sustaining active engagement in a wide range of activities for the benefit of local communities. The W.I. was an important contributor in raising funds and working towards the support of local hospitals, local libraries as well as other causes such as the Cancer Society and the Red Cross.

As one study puts it, "[t]he Women's Institute aims to raise the standard of homemaking, maintain the national tradition of handicrafts, promote education particularly in rural areas, improve the welfare of child and health of the public, teach Canadian Citizenship, have a true spirit of patriotism, promoting world unity and international understanding." [2]

Figure 2 "Mansur Schoolhouse": Photographer unknown, ca 1950, Stanstead County Women's Institute fonds, ETRC, P115

In an interview, Gwen Parker, a member of the Lennoxville Women's Institute, discusses the activities of the W.I. during the war years and how its members supported the Canadian troops overseas: "Another thing they did for the help overseas is that (…) the Belvidere Women's Institute had a canning machine, and they canned all their excess vegetables from the garden, these were shipped overseas."[3]

Another interesting women's group is the Canadian Federation of University Women of Sherbrooke and District (CFUWSD). This women's group is affiliated with the Stephen Lewis Foundation. In 2006, the Stephen Lewis foundation launched the Grandmothers to Grandmothers Campaign to raise awareness and mobilize Canadian support for Africa's grandmothers. This has been enthusiastically taken up by the Sherbrooke and District organization.

Heather Keith, a member of the CFUWSD, explains: "Stephen Lewis started a fund for grandmothers in Africa who were left to their own devices to take care of their grandchildren. In many cases the AIDS epidemic meant that the parents were dying and the grandmothers were left to take care of their grandchildren."[4] In this way the

Figure 3 "Grandmothers to Grandmothers Project, making angels," Sherbrooke and District University Women's Club fonds, ETRC, P123.
The CFUWSD members at an angel making workshop in Lennoxville, Qc; Margie Logan-White, Heather Keith, Janet Cowan Weber and Maggie Tuck. Photograph by Heather Keith (c. 2000)

CFUWSD acts as a support network which advocates awareness about the devastating effects of AIDS in Africa and presses governments and private organizations to become more involved in finding solutions to this terrible situation.

The CFUWSD members participate in arts and crafts workshops and sell their products to raise funds toward furthering the cause of Grandmothers in Africa. They also participate in many activities and events such as the AfriGran Caravan, a mobile event organised to raise awareness across the country about turning the tide of AIDS in Africa. The group consistently helps in founding grassroots projects, bringing moral and financial support to the African Grandmothers and their communities.

The Lennoxville & District Women's Centre (LDWC) is a third women's group that plays an equally active role within the Eastern Townships community. Founded in 1981, the LDWC is an organization serving women throughout the Eastern Townships in a broad range of areas. As a community-based organization serving English-speaking women, the Lennoxville and District Women's Centre serves as a meeting place where women can gather to learn new skills, make new friends, and find valuable information on various subjects. The LDWC contributes to the well-being of the community by offering a support system consisting of workshops and various courses available to accompany and support women in their daily life.

Resources

The ETRC Archives are the repository of the following 17 fonds from the various branches of the Women's Institute throughout the Eastern Townships: Belvidere, Denison, Brompton Road, Lennoxville, Sherbrooke, Ascot, Tomifobia, Way's Mills, Minton, Beebe, Orford, Cherry River, Stanstead County, Massawippi, North Hatley, Hatley Centre, Lennoxville and District.

The variety of archival documents used in the exhibition include newspaper articles, journals, scrapbooks, receipts, correspondence, photographs, minute books, accounts, cartographic material and interviews.

In addition to these archival documents from the ETRC Archives, archival materials from other archives were also included in order to give a more complete picture of Women's groups in the Eastern Townships. The following archives contributed material: LAHMS Archives, Library and Archives Canada, McGill University Archives as well as the McDonald Campus College Archives.

The virtual exhibition includes over one hundred photographs in addition to textual material, cartographic material and interviews conducted especially for this exhibition. In addition to telling the stories of the W.I., CFUWSD, and LDWC, the material displayed in this virtual exhibition provides an interesting source of information concerning the general environmental, social, cultural and economic history of the Eastern Townships region over one century. The historical research, text and digital processing for the exhibition were undertaken by Chloë Southam with the collaboration of Julie Allard. The coordinator of the exhibition project was Jaroslava Baconova, director Ex Officio of the ETRC.

This exhibition is surely worth discovering if you want to know more about the impact of women's organizations in the Eastern Townships or want to know a little more about the history of women's issues and way of life. The exhibition is now available on the VMC website at *www.virtualmuseum.ca*. It can also be consulted through the following link: *http://www.virtualmuseum.ca/pm_v2.php?id=exhibit_home&fl=0&lg=English&ex=749*

ENDNOTES

1 Gabrielle Blais, Directrice générale, Canadian Heritage Information Network, April 6, 2010. (Letter to Ms. Jaroslava Baconova, Executive Director of the ETRC.)

2 A brief history of women's organizations in Lennoxville was compiled by Jane C. Pearson, P.5. (HQ 1910.L4) P4 ETRC Archives.

3 Interview with Gwen Parker, a member of the Lennoxville Women's Institute, September 28th 2010, Felton Rd, Sherbrooke.

4 Interview with Heather Keith, a member of the CFUWSD, September 27th 2010, Bishop's University, Lennoxville.

LES CANTONS-DE-L'EST

par Guy Laperrière
Québec, Presses de l'Université Laval (Institut québécois de recherche sur la culture, Collection : les régions du Québec. Histoire en bref, n° 13), 2009, 197 pages

Recensé par Jean-Pierre Kesteman

Il y a trente ans, l'Institut québécois de recherche sur la culture lançait un gigantesque chantier d'élaboration de l'histoire des régions du Québec. Dans un contexte où, depuis plus d'un siècle, l'essentiel de l'histoire québécoise gravitait autour de Montréal et de Québec, cette initiative allait élargir et approfondir la compréhension du passé de la province. Elle s'est matérialisée dans une vingtaine d'ouvrages, souvent imposants. On y trouve en effet un exposé des diverses facettes de l'histoire : démographique, politique, sociale, économique et culturelle, des origines du peuplement à nos jours, le tout enrichi d'un appareil de références aux sources et de nombreuses illustrations. Le volume consacré aux Cantons-de-l'Est, œuvre d'une équipe d'historiens, a été publié en 1998. Depuis lors, avec l'appui des Presses universitaires de l'Université Laval, les promoteurs de la collection ont voulu offrir au public une version abrégée de l'histoire de chaque région, élaborée à partir des grands volumes déjà publiés. Un véritable défi pour aboutir à un ouvrage de moins de 200 pages de format réduit, agrémentées de tableaux et d'illustrations !

Pour les Cantons-de-l'Est, Guy Laperrière a relevé brillamment ce défi tout en réussissant le tour de force de rédiger un ouvrage original. L'auteur, qui est un historiographe chevronné, a en effet tiré parti des nombreuses publications qui sont apparues depuis une vingtaine d'années et dont ne faisait pas encore état le volume original. L'information s'est ainsi notablement enrichie, particulièrement pour le 20e siècle. La participation aux deux conflits mondiaux, les conditions de vie des travailleurs, les institutions religieuses catholiques et protestantes, les diverses facettes de la vie culturelle, tous ces sujets et bien d'autres trouvent ainsi leur place dans ce regard synthétique sur notre passé.

De plus, profitant du recul par rapport à ses devanciers, l'auteur nous propose une périodisation différente de l'histoire de la région.

Le texte est en effet structuré en six chapitres, de taille équilibrée, précédés d'une introduction sur le découpage régional et les traits géographiques des Cantons-de-l'Est. Rappelons que, comme pour l'ouvrage de 1998, le volume couvre non seulement l'Estrie mais la vaste région des Cantons-de-l'Est, du Piémont des Appalaches aux confins de la région de l'Amiante et de la Beauce. L'auteur décrit successivement l'époque des Amérindiens, l'arrivée des Américains et des Britanniques (1783–1840), l'ère de la colonisation et du chemin de fer (1840–1890), l'ère de l'électricité et de l'automobile (1890–1920), l'ère de la grande industrie (1920–1960), et enfin, l'époque récente qu'il intitule « une région de services et de tourisme (1960 à nos jours) ».

D'emblée, il tire profit des découvertes archéologiques récentes près de Lac-Mégantic pour reculer jusqu'à 12 500 ans avant aujourd'hui les premières traces de présence amérindienne, ce qui fait des Cantons-de-l'Est la région la plus anciennement peuplée de la province. Par ailleurs, il propose un découpage plus fin de la période qui va de 1840 à nos jours, largement basé sur l'évolution des techniques et des secteurs dominants de l'activité économique. Cette démarche permet au lecteur de 2010 de disposer d'un cadrage plus adéquat du 20e siècle en retenant l'importante césure de 1960, amorce à la fois d'un rôle accru de l'État, d'une phase de désindustrialisation, de l'émergence des services comme élément structurant et du poids grandissant des milieux urbains. Ce sixième chapitre, qui s'étend jusqu'à l'aube du 21e siècle, réjouira ceux qui souhaitaient disposer d'une lecture synthétique de l'évolution de notre région depuis 50 ans.

Un condensé devrait être par nature sec, maigre et quelque peu indigeste à lire. Ce n'est absolument pas le cas ici. Tout en rapportant les éléments importants et les facteurs de structuration de la vie régionale, l'auteur réussit l'exploit d'agrémenter l'exposé d'exemples concrets, voire pittoresques, et d'indications spatio-temporelles précises. Il y a beaucoup de chiffres, de dates, de noms de lieux ou de personnages et pourtant, le texte n'a rien d'encyclopédique. C'est que l'exposé, mené d'une plume vive et directe, à la fois familier, précis et instructif, est en fait un vaste récit, très alerte, qui, dès les premières pages, souvent sur le ton de la conversation, nous entraîne dans une passionnante découverte de deux siècles d'histoire, des hommes et des femmes qui ont « fait » les Cantons-de-l'Est.

Que l'on ne s'y trompe cependant pas. L'ouvrage ne verse pas dans le travers trop répandu des médias de ramener le passé à un ensemble d'anecdotes. Très au fait des ouvrages majeurs publiés dans les dernières années sur la région (et, à ce titre, il tire un excellent parti de la production des écrivains anglophones [J.I. Little et

J.D. Booth entre autres]), l'auteur nous livre la synthèse la plus au point des connaissances récentes sur notre histoire régionale.

L'ouvrage est agrémenté d'un nombre surprenant d'illustrations (qui tirent parti de l'enrichissement des collections des sociétés locales d'histoire), de repères chronologiques et d'une annexe bibliographique centrée sur des ouvrages des deux dernières décennies.

Bref, un bel ouvrage, de format souple, à la typographie agréable. Il s'agit d'une brillante illustration de ce que doit être un livre d'histoire destiné au grand public : riche à la fois en information, en interprétation et en perspectives et agréable à lire.

Notes on contributors / Biobibliographies

Cristian Berco is an Associate Professor in Bishop's University's History Department. He also holds a Tier II Canada Research Chair in Social and Cultural Difference and coordinates the Crossing Borders Research Cluster. He has published extensively on gender, sexuality and disease in early modern Spain.

Formée en littérature et en histoire de l'art, Silvie Bernier détient un Ph.D. en études françaises de l'Université de Sherbrooke. Elle compte plusieurs publications, dont deux ouvrages : *Du texte à l'image : Le livre illustré au Québec* (PUL) et *Les Héritiers d'Ulysse* (Lanctôt Éditeur).

Estelle Chamoux a obtenu son Ph.D. en biologie cellulaire à l'Université de Sherbrooke en 2002. Ses recherches doctorales portaient sur l'endocrinologie des hormones surrénaliennes. Elle a ensuite réalisé un stage d'un an dans un centre de recherche évaluant l'impact du stress sur l'obésité en France, puis est revenue au Québec où elle a fait un stage post-doctoral au service de rhumatologie de la Faculté de médecine de l'Université de Sherbrooke en 2005. Elle y a développé une expertise marquée dans le domaine de la résorption osseuse et la culture d'ostéoclates humains, en plus de publier plusieurs articles sur les pathologies associées à une perturbation de l'homéostasie osseuse. Elle enseigne à l'Université Bishops depuis 2005 et est membre du Groupe de recherche en santé psychologique et bien-être (PHWB).

Gérard Coté est un Sherbrookois de quatrième génération et diplômé en traduction de l'Université de Montréal. Passionné pour l'histoire de sa ville, il consacre des centaines d'heures annuellement à retracer le vécu des gens qui, ayant laissé leur nom à une rue ou autre entité toponymique, ont d'abord posé leur pierre dans la construction de la communauté où nous vivons maintenant. En 1992, il est appelé par la Ville de Sherbrooke à siéger sur son Comité de toponymie. Avec Jean-Marie Dubois, il collabore depuis quelques années à des chroniques saisonnières ou mensuelles sur les toponymes de Sherbrooke publiées dans les journaux communautaires *Regards* du secteur d'Ascot, *L'Info* du secteur de Saint-Élie-d'Orford, *La Lanterne* de l'arrondissement de Lennoxville et dans le journal *La Tribune.*

Jean-Marie Dubois est professeur émérite au Département de géomatique appliquée de l'Université de Sherbrooke. Spécialisé en géographie physique et en interprétation de photographies aériennes depuis 40 ans, il s'intéresse à la toponymie depuis plus de 35 ans, d'abord à celle de la région du golfe du Saint-Laurent, puis comme bénévole au Comité de toponymie de la ville de Sherbrooke depuis 1990. Il est l'auteur ou le coauteur de plusieurs chroniques sur ce sujet dans les journaux locaux ou régionaux et d'un livre sur la toponymie des rues de Sherbrooke pour le bicentenaire de la ville en 2002, rédigé avec Gérard Coté, collaborateur de tous les jours.

Titulaire d'une maîtrise en sciences sociales de l'Université Laval et ancien élève de la London School of Economics and Political Science, **Jacques Gagnon** a fait carrière dans l'enseignement collégial. Il a en outre publié des études politiques aux presses de quatre universités québécoises : Bishop's, Sherbrooke, du Québec et Laval. Il travaille actuellement sur les liens de parenté des députés et sénateurs fédéraux de 1867 à nos jours.

Jean-Pierre Kesteman (Ph.D., UQAM, 1986) est professeur émérite de l'Université de Sherbrooke. Il est spécialiste en histoire économique et sociale et a écrit une quinzaine de livres, essentiellement sur l'histoire des Cantons-de-l'Est .

Elisabeth Levac is an Associate Professor in Bishop's University's Department of Environmental Studies and Geography. She obtained B.Sc. and M.Sc. degrees from the Université du Québec à Montréal and a Ph.D. from Dalhousie University. Her research focuses on the paleoceanography of the North Atlantic Ocean, paleoclimates of Eastern North America, and airborne pollen transport.

Lorne Nelson is a Professor and Chair of the Physics Department at Bishop's University. Although he completed all of his studies outside of the Eastern Townships (he received his Ph.D. from Queen's University and did his postdoctoral studies at the Center for Space Research at MIT), Dr. Nelson's family originates from the North Hatley area. His research interests are related to theoretical astrophysics and he does many of his simulations of cosmic phenomena using computers. Dr. Nelson is also Director of the Bishop's University Astronomical Observatory and he has spent many nights on the roof of the Nicolls building observing some of these same phenomena.

Fuschia Sirois is an Associate Professor in the Department of Psychology at Bishop's University, holds a Tier II Canada Research Chair in Health and Well-being, and is the co-ordinator of the Psychological Health and Well-Being research cluster. Dr. Sirois' research is focused on the connections between self-regulation, health and well-being.

Chloë Southam is a museologist and graduate of Concordia University in Art History and of the Reinwardt Academy in Amsterdam, Holland, where she completed an M.A. in Museology. She has experience in creating and developing exhibitions, developing educational activities as well as working as a museum consultant. Chloe is a native of North Hatley where she continues to work toward the preservation and dissemination of heritage.

ERRATUM

In *Journal of Eastern Townships Studies* no. 36 (Spring 2011), the titles of two articles were mistakenly listed in the Table of Contents. The title of the article by Claude Charpentier, Dale Stout, Annie Benoit, Edith Poulin and Christopher Philip should read: "Availability, Accessibility and Acceptability of English-Language Mental Health Services for the Estrie Region's English-Speaking Population: Service User and Provider Perspectives". The title of the article by Paul Zanazanian should read: "Towards Developing an 'Anglo-Québécois' Information Resource Book for School History Teachers in Quebec: Thoughts from a Qualitative Study". The guest editors of *JETS* 36 regret the errors and any inconvenience they may cause in consulting our last volume.

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Publication of this journal is made possible by support to the Eastern Townships Resource Centre from the ministère de la Culture, des Communications et de la Condition féminine du Québec, Bishop's University, and Bishop's University Foundation.

La publication de cette revue est rendue possible grâce à l'appui du ministère de la Culture, des Communications et de la Condition féminine du Québec, de l'Université Bishop's et de la Fondation de l'Université Bishop's au Centre de ressources pour l'étude des Cantons-de-l'Est.

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ISSN 1192-7062