SPRING 2010

Arts INSIGHTS

CHALLENGING IDEAS FOR THE FUTURE

THE SCIENCE OF THE Arts

McGill

Arts INSIGHTS

Spring 2010

FACULTY OF ARTS
McGill University
Dawson Hall 2nd Floor
853 Sherbrooke Street West
Montreal, Quebec, Canada H3A 2T6
Tel: 514-398-6211
Fax: 514-398-8102
www.mcgill.ca/arts

EXECUTIVE EDITOR
Nathalie Cooke
Associate Dean, Research and
Graduate Studies

EDITOR
Kathleen Holden, PhD
Communications Officer, Faculty of Arts

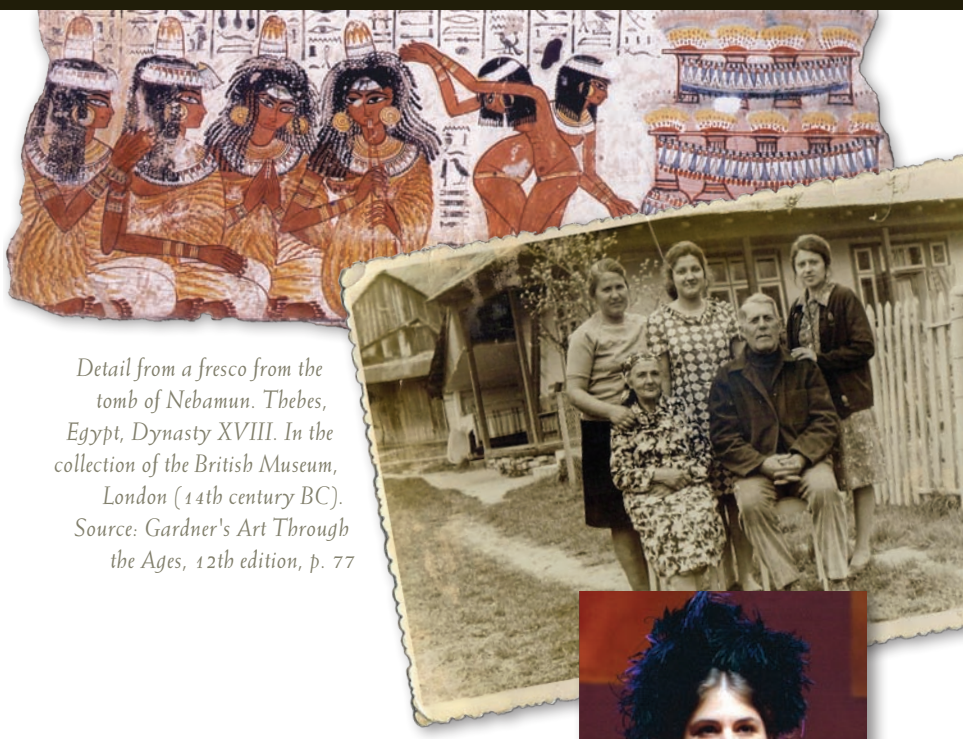
PHOTOGRAPHS
Owen Egan
Danny Haeberlin
Wikimedia Commons

COVER PHOTOGRAPH
Source: http://earthobservatory.nasa.gov/NaturalHazards/natural_hazards_v2.php3?img_id=11984
Image courtesy Jesse Allen, NASA Earth Observatory at NASA GSFC.

Thanks to all volunteer photographers

DESIGN AND LAYOUT
Graphic Design, Public Affairs

Your comments and inquiries are welcome. Please direct them to kathleen.holden@mcgill.ca



Detail from a fresco from the tomb of Nebamun. Thebes, Egypt, Dynasty XVIII. In the collection of the British Museum, London (14th century BC). Source: Gardner's Art Through the Ages, 12th edition, p. 77

CONTENTS

WELCOME TO THIS ISSUE


Owen Egan

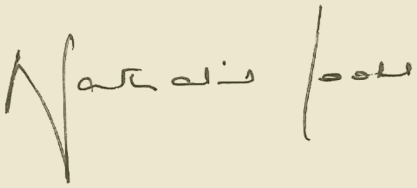
Arts Insights. Insights into our past: the world that shaped us. Insights into our present: our world today. Insights into our future: the world tomorrow.

Over the past three and a half years and seven editions, reflecting our belief that research is a continuum that begins from the time one becomes an undergraduate, *Arts Insights* has introduced you to scholars in the Faculty of Arts at all stages of their careers. You have read about the incredible work being done by our undergraduates; you have read about the range of issues that fascinate our doctoral and post-doctoral students; and you have read about the questions and ideas that drive many of our professors. Some of these scholars work alone; others work in teams. The work of some is wholly contained within their discipline; that of others embraces one or more other disciplines. Common to all is a passion for the work they do.

In this issue, I want to introduce you to six colleagues who are pushing the boundaries of Arts in new and dynamic ways and directions. Whether humanist, social scientist or social worker, what their research reveals is what we describe as "the science of the Arts". All are engaged in collaborative research. All are leaders of teams whose members bring differing perspectives and interpretive frameworks, but complementary skills, to the table. And all are providing new insights into our past, our present, our future.

June 1st marks the end of my term as Associate Dean, Research and Graduate Studies. The past four years have been truly extraordinary. I have been fortunate to come to know better so many of my colleagues across the Faculty, and many of the extraordinary researchers to whom you have been introduced in this publication. To see the excitement they bring to their work and to watch how they are changing our world has been a privilege. As more funding became available during the past few years, it has also been a pleasure to see the Faculty able to offer competitive admissions packages to the best graduate students, many of whom will become leaders in their respective fields. As I hand over the reins to Professor Juliet Johnson of the Department of Political Science, I can guarantee to her that she, too, will feel the palpable energy and excitement in the Faculty as McGill moves ever forward as a world-class research institution.

Welcome to this issue.



NATHALIE COOKE

Associate Dean, Research and Graduate Studies
Faculty of Arts

A NEW DIRECTION FOR CLIMATE POLICY

For more than a year I have been working with a PhD student, Isabel Galiana, on a new approach to climate policy. We termed it a *technology-led* approach because the focus would be on researching, developing, testing and demonstrating new, scalable, and cost-effective low carbon emitting energy technologies without which deep cuts in greenhouse gas emissions will be impossible. Our technology-led approach recognizes that the technological challenge to stabilizing climate is huge. In fact, it is much bigger than we have been led to believe by the Intergovernmental Panel on Climate Change (IPCC), the body of "experts" responsible for assessments of climate science, the impact of climate change, and the means and costs of mitigating such change.

Our technology-led approach includes a role for carbon pricing. But it is not the usual role. Instead of placing a price on carbon via the distribution or auction of carbon emission permits (so-called "cap and trade"), we would employ a carbon tax (or fee or charge). But our carbon tax is not *directly* aimed at reducing carbon dioxide emissions – that would require a relatively high, and rapidly rising tax, one which would be neither politically acceptable nor capable of inducing risky investment in science-driven research and development, the very success of which is both time consuming and uncertain.

Rather we proposed a very low carbon tax of just $5.00 per tonne of carbon dioxide, one that would slowly rise, doubling every decade. Whereas Stephan Dion's un-lamented "Green Shift" would have begun at $10.00/tCO2, and risen by $10 each year until reaching $40 four years later, ours would not reach $40.00 until 2040. The reason for the difference in strategy is two-fold: our low carbon fee is designed to finance a technological revolution,

"...let the global technology race begin..."

and would easily fund upward of $100 billion in RDD&D (research, development, demonstration and deployment) every year to do so. Over time, while new scalable, cost effective technologies are brought to fruition, the slowly rising carbon tax would send a forward price signal to deploy and diffuse low carbon technologies as they reach "the shelf" (become ready).

In September 2009, Isabel and I presented our work to the Copenhagen Consensus on Climate Change project (not to be confused with the UN Conference on climate change in Copenhagen held in December 2009). Our technology-led proposal was ranked second of fifteen proposals assessed by a panel of economic experts including three Nobel laureates. The interest generated resulted in a paper in *Nature*, published just days before the beginning of the UN Copenhagen conference.

In our *Nature* paper, entitled "Let the Global Technology Race Begin", we attempted to make the case for replacing date-specific emission-reduction commitments with commitments to a technology race. Our case rested on the huge technology challenge to stabilizing climate, the glaring inadequacies of current low carbon technologies, and the uncertainty as to when (and if) technological breakthroughs will occur.

We also argued that a technology-led approach could enlist the support of "emerging economies" such as China and India who have made clear they will not agree to emission caps much less make binding commitments to emission reduction targets.

As it turned out the Copenhagen Climate Conference failed to arrive at an agreement on an emission reduction policy to succeed the Kyoto Protocol. To fend off failure, there was grudging agreement to a Copenhagen Accord framed by the US, China, India, Brazil and South Africa. While the Copenhagen Accord acknowledged some long term goals, and proposed to help finance adaptation by very poor countries, it was ambiguous about medium term commitments to emission reductions. For many, the Copenhagen conference was deemed a failure; but for some the Copenhagen Accord was at least successful in avoiding an even greater failure: a repeat of the flawed and failed Kyoto approach to international climate policy.

The Copenhagen conference revealed the need for a new approach to climate policy. Since February, Isabel and I have worked with a dozen other social and climate scientists from OECD countries on the case and framework for a new climate policy. A paper titled after Hartwell House in England where it was conceived (Isabel was one of the co-authors present), and subtitled "a new direction for climate policy after the crash of 2009", will be launched in mid-May 2010. The paper will include some of the Galiana-Green ideas from our 2009 papers, but is cast in a larger, more historical context. Time will tell whether it resonates with those who influence and/or are responsible for climate change policies.

CHRISTOPHER GREEN *is Professor of Economics*
ISABEL GALIANA *is a doctoral candidate in the Department of Economics*

ARE PRIMATE DISEASES A CONCERN FOR CONSERVATION AND HUMAN HEALTH?

The sudden appearance of diseases like SARS and swine flu, the devastating impacts that diseases like Ebola have had on both human and wildlife communities, and the immense social and economic costs created by viruses like HIV (AIDS) underscore our need to understand the ecology of infectious diseases. Given that monkeys and apes often share parasites with humans, understanding the ecology of infectious diseases in non-human primates is of paramount importance. This is well illustrated by the HIV viruses, the causative agents of human AIDS, which evolved recently from related viruses of chimpanzees and sooty mangabeys and the outbreaks of Ebola virus that trace their origins to transmissions from local apes.

Although humans have always shared habitats with non-human primates, the dynamics of human-primate interactions are changing radically. Over the last several decades, humans have been responsible for massive, irrevocable changes to primate habitats. Most primates today live in anthropogenically disturbed habitat mosaics of farmland, human settlements, forest fragments, and isolated protected areas. As habitat degradation forces humans and primates into closer and more frequent contact, the risk of disease transmission between humans and non-human primates increases.

One of the best examples of the close interactions between a group of parasites and primates concerns malaria; a parasite that dramatically impacts human and potentially non-human primate populations. There are an estimated 300 to 500 million clinical cases of malaria every year and 0.7 to 2.7 million deaths per year linked directly to malaria. Converting this to a more comprehensible statistic; every 40 seconds a child dies of malaria. However, the actual figures are likely to be substantially higher owing to under-reporting and difficulties of diagnosis. There has been frequent transmission of the Plasmodium parasite causing malaria between humans and non-human primates. There are four major human malaria parasites *Plasmodium falciparum*, *P. vivax*, *P. ovale*, and *P. malariae*. *P. falciparium* can infect owl and squirrel monkeys. *P. malaria* is thought to have been transmitted from chimpanzees to humans, but in South America, it has gone from humans back into non-human primates. *P. vivax* is thought to have been derived from a monkey malaria strain between 40,000 and 60,000 years ago in Southeast Asia. There is even the possibility that a new strain of human malaria will soon emerge to have global impact – *P. knowlesi* in Malaysian Borneo. The natural hosts of *P. knowlesi* are long-tailed and pig-tailed macaques.

We have been working in Kibale National Park in western Uganda for 20 years studying the ecology and behaviour of primates. One of the questions we have been intrigued with is what regulates the population size of the monkeys, a question that has obvious conservation implications. We have focused on the endangered red colobus monkey. We initially studied their nutrition, but soon turned to considering diseases. We have made a number of discoveries. For example, despite the importance of AIDS in human health, scientists still know very little about the diversity and ecology of AIDS-like viruses in nature. We have discovered three new HIV like retroviruses in red colobus monkeys. We also found that humans living near forest fragments harbored *Escherichia coli* bacteria that were ≈75% more similar to bacteria from primates in those fragments than to bacteria from primates in nearby undisturbed forests. This suggests there is repeated exchange of bacteria between non-human primates and humans. Working on disease questions and working with the local community on conservation issues, made us acutely aware of disease issues in the local population and motivated us to help. Thus, with the help of the students in the Canadian Field Studies in Africa Program, we raised the funds and built a local health care clinic named the Kibale Health and Conservation Centre.

Returning to the original question: are primate diseases a concern for both conservation and human health? I think that the answer is obviously "yes", which reinforces the importance of research on the dynamics of primate diseases. A consideration of how environmental change may promote contact between humans and non-human primates and increase the possibility of sharing infectious disease detrimental to humans or non-human primates is now paramount to conservation and human health planning. Forest fragmentation, anthropogenic disturbance within forests, primate ecology, and human behavior all influence bidirectional transmission of diseases between non-human primates and humans. Targeted interventions on any of these levels should reduce disease transmission and the emergence of novel diseases.

"...there is repeated exchange of bacteria between non-human primates and humans"

COLIN CHAPMAN *is Professor of Anthropology and Canada Research Chair in Primate Ecology and Conservation*

Red colobus monkey (above); the Health Centre (middle); Ugandan children (below)

McGILL HEALTH DIALOGUE

From the top: Carmen Lambert is Associate Professor of Anthropology; Hélène Riel-Salvatore is a Faculty Lecturer in the English and French Language Centre; Estelle Hopmeyer is Associate Professor in the School of Social Work.

The McGill Health Dialogue Project, under the aegis of McGill University, aims to ensure that English-speaking people in Quebec have equitable access, in their own language, to the full range of health and social services. The objectives of the Project are to ensure that English-speaking people are able to communicate easily and effectively, in their primary language, with the health and social services professionals who serve their needs and to increase the number of English-speaking professionals working in the health and social services system. First funded in 2004, the Project is an additional tool to support the implementation and enhancement of regional programs of access to health and social services in English as provided for in the *Act Respecting Health and Social Services*. The Project has now received funding for its second phase, which will carry it through 2013. This will allow those involved to build on achievements realized during phase one.

McGill plays a central role in the Project including, in particular, the range of English-language professional programs it offers and its innovative partnership models, both of which have contributed to the Project's success in bridging the gap between community organizations and health and social service establishments to increase access to health care and social services in English. Under the direction of Professor Carmen Lambert and her team at McGill, the Project's many accomplishments include: the English language training of over 5,500 francophone professionals and other individuals; 22 pilot internship partnerships to retain professionals in the regions; the delivery of public health programs by Telehealth to 11 remote English-speaking communities; the development of a distance professional support program; and the establishment of an inter-university research team.

Built on the strength of phase one and the recommendations stemming from an evaluation conducted of that phase in 2008 and from stakeholder consultations, phase two of the Project is both strategically designed and outcome focused. It is rooted in the needs identified by both the English-speaking community and the health and social services network and relies on both the good will of the personnel involved to improve their communication skills and the commitment of the institutions involved to adapt their services to the English-speaking population. The Project has the support of the *Ministère de la santé et des services sociaux* and the English-speaking community, and today counts among its partners some 130 public and private stakeholders. The Project operates within Quebec's health and social services system, in accordance with legislative provisions governing the dispensing of health and social services in the English language and the organization of resources.

Over the next phase, three measures will be implemented:

- The McGill Language Training Program which aims to provide English for professional purposes to ensure that French-speaking health and social services personnel have opportunities to improve their ability to provide services in English to their English-speaking clients in the regions of Quebec, and French for professional purposes for English-speaking personnel in order for them to integrate better into the Quebec health and social services system.
- The McGill Retention and Distance Professional and Community Support Program which seeks to ensure effective communication in English between English-speaking Quebecers and the health and social service workers who serve their needs and to increase the participation of English-speaking personnel in Quebec's health and social service system.
- The McGill Research Program which is designed to build upon the knowledge gained through the work conducted in the first phase of the Project, to develop new research projects which investigate potential means to overcome identified barriers to health care access for linguistic minorities, and to increase the dissemination and adoption of knowledge, strategies and best practices to address the health concerns of official language minority communities.

Through the planned activities associated with the three measures, the Project intends to realize its goal of building and maintaining a sufficient complement of health and social services personnel capable of providing services in English in order to serve the needs of English-speaking Quebecers. As Principal Investigator, Professor Carmen Lambert has said: "This [Project] is about more than just healthcare. We are working to allow communities, big and small, to develop on social, economic and cultural levels."

... aims to ensure that English-speaking people in Quebec have equitable access, in their own language, to the full range of health and social services ...

COMPUTATIONAL ARCHAEOLOGY AT McGILL

Archaeologists use scarce, fragmented, broken data to try to reconstruct past social systems. We have access to a set of information that represents an unknown proportion of an unknown initial population, selected and transformed over time by processes that we haven't begun to understand. In that sense, archaeology is largely a hopeless endeavour. And yet, if we are to understand who we are and where we might be heading, if we are to make informed decisions about the challenges we face in the present, it is important to know where we come from, and what solutions have worked or failed when humans have faced similar challenges in the past. When it comes to imagining the overwhelming bulk of the human past, all we have to go on are stone flakes and a few broken bits of burnt bone. For a fairly small portion of the past, we can add smashed bits of pottery and a few landscaping and building efforts to our already impressive database. For a very short period of the past, we have access to confusing, difficult to interpret, highly biased scraps of writing.

Given the quantity and quality of data available to us for reconstructing past human social systems, we need to explore every tool that could even be remotely helpful. It is very easy to generate hypotheses that are consistent with highly fragmentary data. In fact, any number of hypotheses can accord with and link a single set of observations made on the basis of such information. The difficult part in archaeology is to test those hypotheses and decide which ones are preferable in that they are a closer representation of what actually happened in the past. Computational tools such as computer simulation and geographical information systems (GIS) are ideal tools both for helping generate hypotheses about the past (the easy part) and for testing them (the hopefully not impossible part).

A model, whether in the form of a computer simulation of social processes, or a GIS model of space, its content, and processes, is simply an abstract representation of reality. If we understand how a particular phenomenon works, then we can map its main features and make it happen in an artificial environment, such as a computer processor. If we encode our understanding of the phenomenon in a computer program, put the simulation in action, and fail to replicate the expected outcome, then our understanding is faulty. It always is. But some computer programs produce faultier outcomes than others, and this allows us to refine our understanding of the phenomena we study.

The following is just a sampling of the approaches currently being used in the Computational Archaeology Laboratory. Together, and in combination with many others, they allow us to get closer to a more complete and more useful understanding of the past. For example, a combination of Julian Xue's insights into intolerance and conflict, combined with Sam Vaneeckhout's understanding of some of the drivers of population aggregation has great potential for helping us understand regional warfare. Add to that Colin Wren's work on modeling paths and cost of transport, and the long-term evolution of regional settlement patterns can suddenly be illuminated. Using data centralization and mining tools like the ones developed by Neha Gupta and Chris Ames, this work could really start answering some interesting questions about how we became who we are.

ANDRE COSTOPOULOS *is Associate Professor of Anthropology*

Current Research

COLIN WREN, a PhD student and Tomlinson Scholar in the Computational Archaeology Laboratory, models patterns of interaction and exchange in the past. More specifically, he has been working out how and where goods were exchanged in the James Bay region of Northern Quebec up to 5000 years ago. Using geochemical signatures, he determines where the ceramics and stone tools that we find in archaeological sites might have come from. He then uses cost of travel and path finding algorithms to suggest likely routes by which they might have traveled from their source to the sites in which we find them. He evaluates the suggested routes on the basis of what we know of human locomotion and also on the basis of the content of local oral traditions about long-distance travel and exchange. The suggested routes themselves give us new starting points in the search for new sites that might have been stopping points or perhaps major exchange centers.

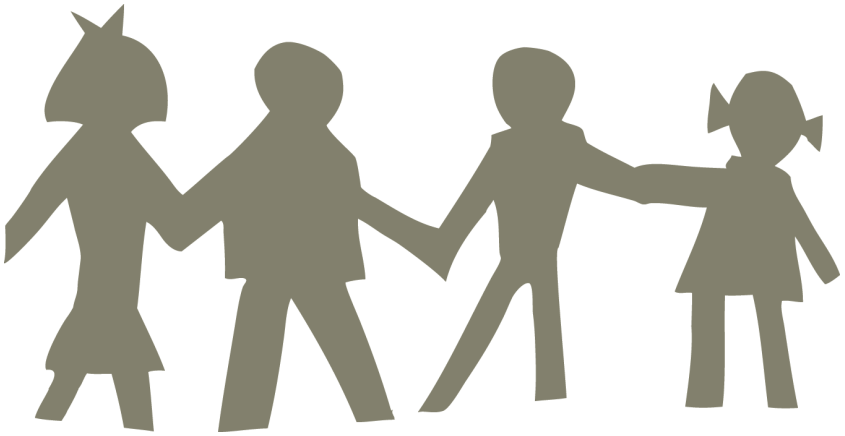
NEHA GUPTA, another of our PhD students, uses GIS to map the development of Indian archaeology over time. By mapping and animating through time the activities of the various archaeological agencies in India, she is discovering how priorities and activity foci have changed in Indian archaeology. Using this time map of Indian archaeology as a starting point, she delves into archives to understand how the chrono-spatial patterns she observes were produced by the interaction between national and regional agencies, each with their own distinct priorities and capabilities.

JULIAN XUE, an MD/PhD student in our lab, is very interested in the evolution of tolerance and intolerance in human groups. His computer simulations of social systems focus on explanations for the development of intolerance in human groups. He is interested in whether intolerance is inevitable. Intolerance is strongly associated with intergroup conflict and armed violence among humans. We find evidence of intergroup violence far back into the archaeological record, and we must take it into account as a factor in any explanation of the past.

CHRISTOPHER AMES, a PhD student in the lab and Vanier recipient, has recently examined how we can determine whether there was a major transition in the archaeological record of the southern British Columbia coast, and when such a major transition might have taken place. The consensus in the literature has always been that technology in the Pacific Northwest went from being dominated by chipped stone tools about 5000 BC, to being dominated by polished or ground stone tools by about 1000 BC. But how and when that transition took place, and whether it was gradual or abrupt have always been a bit of a mystery. By designing a sophisticated data base structure, bringing together a wide variety of published and unpublished data from 40 years of excavation in BC, and by mapping all of it in a chrono-spatial framework, he was able to show that there is a relatively abrupt technological transition at about 2900 BC. He was also able to show that chipped stone tool technology does not disappear at the expense of polished stone tools, but that after 2900 BC there is a sudden diversification of technologies to include bone and polished stone. He also showed that the first applications of polished stone technology in the region were in the form of ornamental beads rather than in the form of tools.

SAMUEL VANEECKHOUT, a recent PhD from Oulu University in Finland who has worked extensively with our lab, has used GIS and simulation to develop new insights into the relationship between human settlement patterns and environmental variability in time and in space. His work shows clearly that, at least in the case of northern hunter gatherers, populations tend to aggregate into permanent villages in periods when there are both rapid environmental change and great environmental variability at the regional scale. In times of rapid change, some places are preferable to others. Conversely, populations tend to scatter, remain mobile, and avoid aggregation when regional environmental variability is low, regardless of the rate of environmental change. When given the option, it seems, that is when any place is about as good as any other for living, prehistoric northern hunter-gatherers preferred to live in small groups and avoid the complications of settled village life.

MARIAGE OU UNION LIBRE : QUELLE IMPORTANCE ?



Depuis la fin des années 1960, la famille a connu de profonds bouleversements dans la plupart des sociétés occidentales. La baisse rapide de la fécondité, la progression du divorce et des séparations, le recul du mariage légal et la montée de l'union libre sont venus tour à tour modifier le visage des familles et ont entraîné des bouleversements dans le déroulement de la vie familiale, bouleversements dont on peine à mesurer l'ampleur et dont on connaît encore assez peu les mécanismes et les répercussions à plus long terme sur la vie des individus. La vie familiale n'est plus réglée comme autrefois par un contrôle social contraignant; les parcours familiaux des individus se sont transformés, devenant moins prévisibles tant pour les hommes, les femmes que les enfants.

J'analyse depuis plusieurs années, avec l'aide de collègues – étudiants et chercheurs –, diverses facettes des multiples changements qui ont transformé la vie des familles au Canada. Parmi les projets que je mène actuellement, un des plus stimulant porte sur la formidable progression que l'union libre a connue comme base de la vie conjugale et comme porte d'entrée dans la vie familiale, tout particulièrement au Québec. En moins de 40 ans, le mariage, autrefois essentiel pour la vie de couple et la venue des enfants, a été graduellement supplanté, pour une proportion très importante des jeunes, par l'union libre la première fois qu'ils se mettent en union. C'est aussi devenu une pratique courante parmi les parents qui forment un nouveau couple à la suite d'une rupture d'union et qui fondent une famille recomposée. Le mariage n'est pas disparu, mais son recul apparaît encore plus manifeste lorsqu'on constate que plus de la moitié des naissances enregistrées au Québec sont le fait de couples en union libre.

Tous ces changements se sont produits sans grands débats sociaux. Récemment cependant, une cause débattue à la Cour supérieure[1] du Québec a provoqué une réflexion et des échanges passionnés. La question soulevée est la suivante : Y a-t-il identité entre mariage et union libre? Et, par conséquent, les conjoints de fait doivent-ils être soumis l'un envers l'autre aux mêmes obligations et devoirs que les conjoints mariés, une fois leur union rompue?

Nos travaux, pris en considération par la cour, ont montré qu'il subsiste des différences notables entre les deux formes d'union. Les couples mariés continuent d'avoir plus d'enfants que ceux qui sont en union libre. Ces derniers affichent, par ailleurs, une plus grande instabilité conjugale, que les premiers, et ce même lorsqu'on ne tient compte que de ceux qui ont des enfants.

Beaucoup de questions restent en suspens et sont au centre des travaux que j'entreprendrai au cours des prochaines années avec Évelyne Lapierre-Adamcyk[2], experte en démographie de la famille. À partir des données recueillies par Statistique Canada en 2006 dans le cadre d'une grande enquête, nous chercherons d'abord à établir l'importance croissante qu'occupe l'union libre à travers les générations comme mode d'entrée tant dans la première que dans la seconde union. Nous mesurerons également la part – déclinante au fil du temps – de couples qui transforment leur union libre en mariage, ce même après l'arrivée d'enfants dans la famille, et nous comparerons la stabilité des unions libres et des mariages, qu'ils aient ou non été précédés d'une union libre. À partir de ces analyses, on tentera de cerner où l'union libre se situe par rapport au mariage : constitue-t-elle un prélude au mariage qui, en quelque sorte, remplace les fiançailles d'autrefois? Forme-t-elle plutôt un mariage à l'essai, c'est-à-dire une période de vie commune pendant laquelle les conjoints peuvent tester la solidité de leur relation avant de légaliser leur union? Ou est-elle tout simplement devenue un substitut au mariage, un cadre de vie à

[1] *Cause connue sous le nom de « Éric contre Lola » qui a été entendue par la Cour supérieure [Chambre de la famille] du Québec en janvier 2009 et qui a fait l'objet d'une large couverture dans les médias québécois. Le jugement, rendu en juillet 2009, a été porté en appel.*

[2] *Professeure émerite, Université de Montréal.*

Y a-t-il identité entre mariage et union libre? Et, par conséquent, les conjoints de fait doivent-ils être soumis l'un envers l'autre aux mêmes obligations et devoirs que les conjoints mariés, une fois leur union rompue?

l'intérieur duquel on choisit d'avoir et d'élever ses enfants? Enfin, on cherchera à caractériser dans quelle mesure les couples qui optent pour une forme d'union ou l'autre se distinguent en regard de leurs caractéristiques démographiques et socioéconomiques. Ces analyses revêtent une importance particulière au moment où les tribunaux et le législateur s'interrogent sur la possibilité de traiter comme « mariés » les conjoints de fait ayant eu des enfants ensemble qui décident de se séparer.

Ces travaux quantitatifs, qui permettent de situer les phénomènes étudiés pour l'ensemble de la population, reposent sur l'utilisation de données très détaillées sur la chronologie des divers événements dans la vie des individus et des couples. Ces données sont disponibles pour notre équipe au Laboratoire sécurisé du Centre interuniversitaire québécois de statistiques sociales (CIQSS) qui a été installé à l'Université McGill grâce à une subvention de la Fondation canadienne pour l'innovation (FCI) obtenue par la Chaire de recherche du Canada en Statistiques sociales et changement familial qu'occupe Céline Le Bourdais.

CÉLINE LE BOURDAIS *est professeur au Département de sociologie et Chaire de recherche du Canada en Statistiques sociales et changement familial.*

NEW TECHNOLOGY IN COSTUME DESIGN

Groundbreaking work in digital technology is coming from a surprising place; the costume shop in the basement of the Arts Building at McGill University.

"I didn't know this place existed" is a phrase frequently heard in the basement annex of Moyse Hall, but perhaps not for long. Resident Costume Designer, Catherine Bradley, has been recognized for her work in digital costume design. The United States Institute for Theatre Technology lists her work as one of the significant breakthroughs in the field of costuming over the last 50 years.

Thanks to seed funding by McGill and a grant from SSHRC, Bradley has assembled a team to make costume illustration more accurate and user friendly. Her method uses Adobe Photoshop to create a digital outline of the actor as the starting point for digital illustration. Her technical advisor, Sawssan Kaddoura, MA student, designed methods that are simple enough for beginners and non-artists to use to create accurate costume illustrations entirely digitally. Interestingly, when Bradley wrote the grant proposal for this project, the word "avatar" was replaced in her text, since the general public wasn't familiar with the term at the time.

This marriage of art and technology brings new vitality to the time honored tradition of turning cloth into clothing.

The digital outline of the actor, or avatar, is the building block of Bradley's work. Hers don't leap off cliffs on the backs of fantastical creatures. They do, however, give designers the ability to portray costumes realistically in the design phase of a project, for theatre, film, and television. What's more, the ability to create realistic costume illustrations does not require a prior background in computer graphics.

Using the two dimensional costume illustration, Bradley came up with a new concept in costume design. She created the *Costume Technical Sheet*, which is a template for transferring the costume illustration onto a scaled grid. This allows the production team to measure the dimensions of each costume detail. This level of accuracy has long been the professional standard in set design, furniture design, and architecture. No contractor would build a house without detailed technical drawings. For some reason, costumes have always been portrayed using artistic sketches rather than technical drawings.

Since the human body is rounded and irregularly shaped, technical drawings have not been considered feasible or necessary for costumes. To compound this problem, costume sketches are often purposely elongated, under the impression that the garment will look more flattering on a tall, thin body shape. The flaw in the traditional approach is that the actor's own proportions are often significantly different from that of a super model. After months of work, the director will see the costume onstage in dress rehearsal, and realize that it doesn't look like the sketch that they approved at the start of the process. At this late date, it is often prohibitively expensive, or even impossible to make changes.

The significance of this breakthrough is that the director can see exactly what a particular costume will look like on a specific actor before any time or money has gone into the production of the garment. Changes to the costume can be made in advance, while the costume is still on the drawing board, or in our case, the computer screen. For anyone concerned with money and time, this facilitates savings in materials, payroll, and improved workflow.

We have shared our technique with the heads of design at the National Theatre School of Canada, who asked us to create a second technique particular to their needs. They wanted to start with the atmospheric costume illustration, and convert it into an illustration that shows the costume on the particular actor who has been cast in the role.

In response to their needs assessment, we developed the system that we call *Changing Proportions*.

We begin with the traditional illustration, and transform the proportions digitally to "fit" the actor outline, using digital techniques for stretching and morphing the image. Once the image corresponds exactly to the actor's proportions, it is transferred onto the Costume Technical Sheet. The specifics of the tech sheet provide the cutters and patternmakers with the details that they need to accurately produce the costume. Used in combination, the traditional costume illustration illuminates the artistic vision of the production, and the digital Costume Technical Sheet provides the specificity needed to actually produce the costume. Fabric yardages can be calculated from the template, and specific garment details can be accurately measured. Costumes can be "previewed" before any time or money has been spent making the costume. Style changes and color variations can be previewed digitally before the seamstress takes a single stitch. This marriage of art and technology brings new vitality to the time honored tradition of turning cloth into clothing.

This project was made possible thanks to McGill University and SSHRC. All techniques discussed in this article are explained on the project website http://digitalcostumeproject.mcgill.ca. Bradley's next project involves digital fabric textures, in collaboration with a colleague from Computer Science. Sawssan Kaddoura has just completed her studies in Game Design at Université de Montréal.

CATHERINE BRADLEY *is a Professional Associate in the Department of English and Resident Costume Designer*

Donny Hoebelin

The 1938 Butterick Pattern image (top row, left) portrays an idealized figure over seven feet tall. The image is digitally transformed to fit the proportions of our modern actress, who is five feet tall. Subtle changes make the style more flattering for the modern actress, allowing the director to preview the costume before it is made.

MQ
UP

Arts Insights, a new series from McGill-Queens University Press, showcases current research in the social sciences, humanities, and social work.

Arts Insights, an initiative of McGill's Faculty of Arts, brings together research in the Social Sciences, Humanities, and Social Work. Reflective of the range of expertise and interests represented by the Faculty of Arts at McGill, *Arts Insights* seeks manuscripts that bring an interdisciplinary perspective to the discussion of ideas, issues, and debates that deepen and expand our understanding of human interaction, such as works dealing with society and change, or languages, literatures, and cultures and the relationships among them. Of particular interest are manuscripts that reflect the work of research collaborations involving McGill faculty and their colleagues in universities that are part of McGill's international affiliation network.

Arts Insights will publish two titles a year in English. The editors prefer original manuscripts but may consider the English language translations of works that have already appeared in another language.

www.mcgill.ca/arts