

Research matters

Volume 1 No. 2

Memorial University's RESEARCH MAGAZINE

A hand holding several colorful shopping bags (green, purple, red, yellow) in a narrow stone street. The street is lined with old stone buildings and has a cobblestone path. A black street lamp is visible on the right side of the street.

BUSINESS RESEARCH
SHAPES SHOPPING
TRENDS

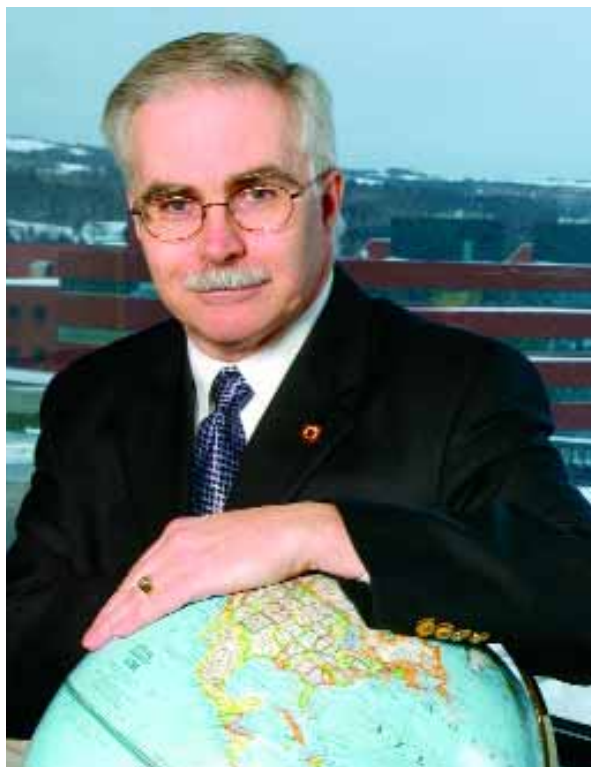


Memorial
University of Newfoundland

RESEARCH AT MEMORIAL

UNIVERSITY is outward looking and directed at issues and problems facing of our province and the world. It is through research that Memorial makes its major contribution to the intellectual portfolio of our province. Communicating the value and impact of that research is always challenging, especially when one considers the depth and breadth of inquiry in which we are engaged. *Research Matters* is one important vehicle.

In this issue, you will read about Dr. Bradley Clissold's fascinating research into the shorthand language of postcards in the late 19th and 20th centuries and how this form of communication affected the literary movement of the time. Dr. Valerie Booth, our newly appointed Canada Research Chair in Proteomics, tells us about her work in developing new pharmaceuticals that one day may help alleviate respiratory distress and immune diseases. As well, you will learn how psychologist Dr. Carole Peterson is helping give children a voice by shattering old myths that young children's eyewitness testimony is inaccurate.



I hope you enjoy this issue of *Research Matters* and, as always, I look forward to your comments about it.

Handwritten signature of Dr. Christopher W. Loomis.

Dr. Christopher W. Loomis
Vice-president (Research)



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Managing editor
Deborah Inkpen
Editors
Joyce MacKinnon
Shannon Crotty
Design
Helen Houston

Photography
Chris Hammond
HSIMS
Justin Maguire and
Cluny South
Harry Ransom
Centre

Contributors
Aimee Sheppard
Tracey Mills
Deborah Inkpen
Lisa Hoffe
Michelle Osmond
Sharon Gray

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Please address any comments or suggestions to Deborah Inkpen, managing editor, *Research Matters*, Office of Vice-President (Research), Memorial University, St. John's, NL, A1B 3X5, e-mail research@mun.ca or phone 709-737-4073

DR. SHERRIE KOMIAK HOPES TO BLUR THE LINES
BETWEEN OFF-LINE AND ONLINE SHOPPING.



BUSINESS RESEARCH SHAPES SHOPPING TRENDS

by Aimee Sheppard

FROM THE TIME she watched the movie *Future World* in the 1970s, Dr. Sherrie Komiak has been interested in artificial intelligence. Now, with a National Science and Engineering Research Council (NSERC) grant to her credit, she hopes to blur the lines between off-line and online shopping by developing sophisticated personalized computer agents as virtual salespersons to improve online shopping.

“The idea is that customers will be able to receive a higher level of service by shopping online at Web sites that use recommendation agents (RAs),” said Dr. Komiak. “RAs are tools that help you quickly find what you are looking for. For example, experienced sales staff can ask you what you like and help you select an item, but this type of service is often only available in high-end retailers. A good RA should be able to help you make better decisions online, therefore making good customer service available at a low cost to a large number of people.”

Her investigation involves three main phases: learning about the client; matching what’s available to the client’s needs; and providing the client with high-quality personalized service. The NSERC grant will be used to address the first two technical phases otherwise known as the product-brokering part of the retail process.

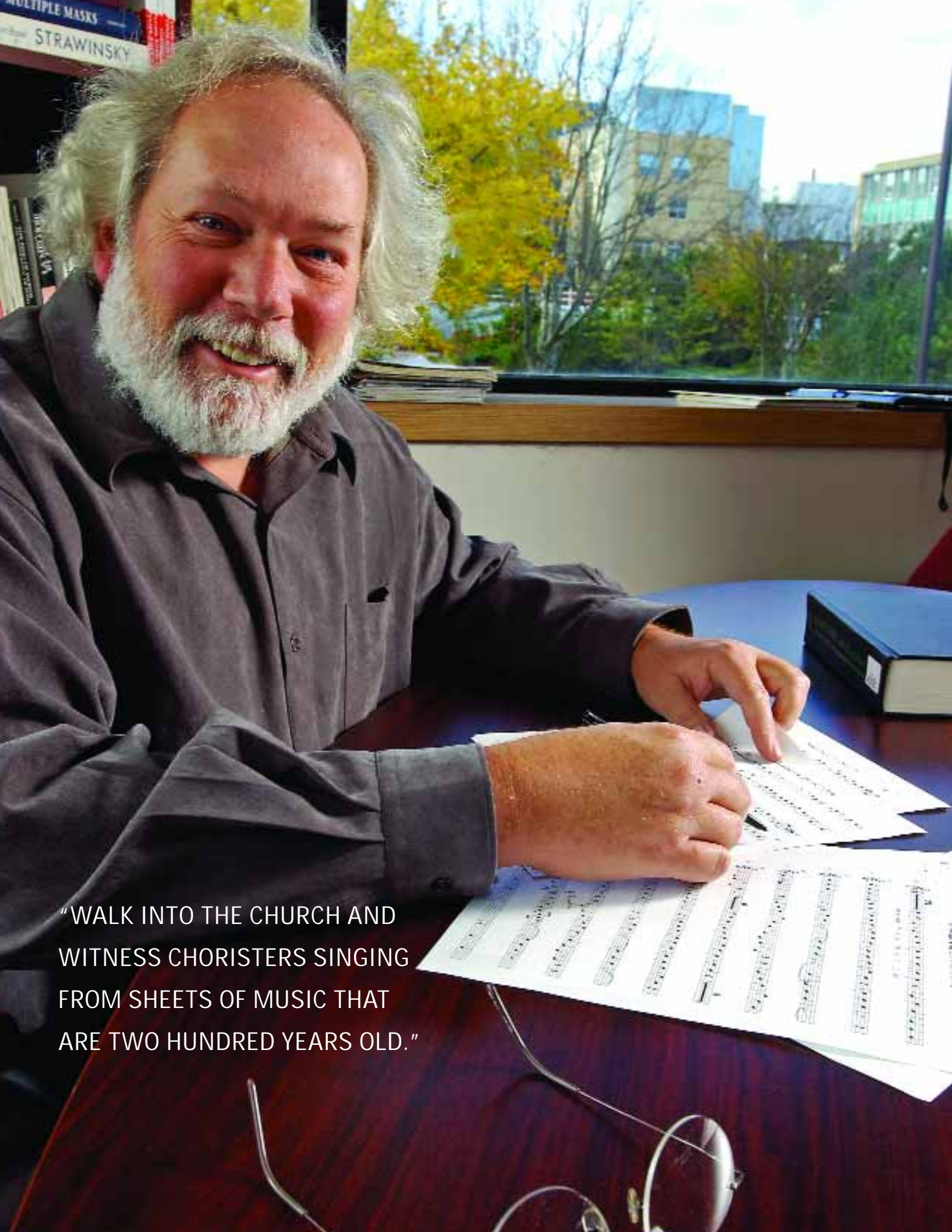
Her goal is to help improve the online retail experience so that it better matches the “real” experience. But she believes the potential exists for the online shopping experience to go beyond the real

thing. In addition to increasing customer satisfaction, enhanced virtual stores can also translate into increased revenue and productivity. “In a real store, one sales person can really only serve one client at one time. In the online world, an RA can be used to serve a large number of people at the same time. Also, in the online world firms are not limited by shelves, so their inventories can be huge. It’s not practical or possible for staff or customers to search such large inventories. RAs help filter the information available to consumers in seconds. As well, personalization tools may enable a customer to select to be served in an alternate language, an option that may not be possible in the physical location.”

Advanced Web sites can also help clients visualize their new product before they buy.

Dr. Komiak explained there are direct and indirect ways to learn about what clients are looking for when they shop online. “The indirect method of learning involves tracking your actions online and making inferences about what you might be looking for while the direct method involves asking you questions. The most effective personalization strategy is to incorporate both methods.”

However, the potential of Web-based RAs has not been fulfilled due to the inadequacy of personalization. Dr. Komiak’s research will address the pitfalls of RAs and will improve their learning capability through improving the design of the questioning and reasoning systems. ■



"WALK INTO THE CHURCH AND
WITNESS CHORISTERS SINGING
FROM SHEETS OF MUSIC THAT
ARE TWO HUNDRED YEARS OLD."

SEAL OIL AND STRING QUARTETS

by Lisa Hoffe

IT IS A STORY that continues to capture the imagination of the director of Memorial's School of Music 30 years after he first heard it.

"It may very well be our best kept cultural secret," said Dr. Tom Gordon. "Very few people know that the Inuit of Labrador were performing – in Inuktitut – the music of Mozart, Haydn and Bach, as well as many other European composers of the 18th century, before there were even choirs or orchestras in Montreal or Toronto."

Dr. Gordon first came by this "remarkable curiosity" in a conversation with a university colleague in Toronto in the 1970s. At the time, Allison MacKay performed with the Toronto Consort, playing early music on period instruments. The group had travelled to Nain to hear the Inuit choir and orchestra play. "Allison came back after a week and she was just overwhelmed. 'You wouldn't believe it,' she said, 'they are playing on historic instruments and performing authentically in an 18th century style.'" Dr. Gordon added, "Since Nain Labrador seemed like it was on another planet, all I could do was file this remarkable story away. But 25 years later, I found myself here at Memorial and wondered how the story had progressed since I first heard it."

The anomaly of Mozart in Inuktitut is a musical outcome of the efforts of European-born missionaries from the Moravian Church who settled in northern Labrador in 1771 to Christianize the Inuit. Dr. Gordon's fascination with this musical history led him

to two authorities on the subject. Religious Studies professor Dr. Hans Rollman has extensive knowledge of the Moravian documents and has completed an archival photograph album from the Labrador missions in 2002. Tim Borlase, director of the Labrador Institute facilitated Gordon's first visit into the Labrador community.

What Dr. Gordon found on his subsequent research visits to Nain, Makkovik and Hopedale was more than 10,000 pages of music manuscript, some 165 works of music for choir and orchestra, all handwritten with text in Inuktitut. While Dr. Gordon dates the earliest at 1802, the music in the manuscript is older still.

"It is a very unique body of music," said Dr. Gordon. "Some of the oldest music in Canada and some of the oldest music performing traditions in Canada are found in these three villages on the Northern coast of Labrador. "It's not just the age of the manuscripts that make them unique. It is the same music from the same composers that was performed in Moravian congregations elsewhere, but the Inuktitut versions were never printed." According to Dr. Gordon, the music was probably translated at the Moravian mission's center in Herrnhut, Germany, by a former member of a mission to Greenland who could speak Inuktitut and then sent to Labrador.

What's more, the 200 year-old repertoire is still being used today. Although the church choirs have more or less disbanded in Hopedale and Makkovik, the

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“SHE SAID A COUPLE OF YEARS AGO THEY HAD THOUGHT ABOUT THROWING OUT THE MUSIC BECAUSE NO ONE WAS USING IT ANYMORE.”

manuscripts are used every week by the choir and string ensemble in Nain. “On a Sunday morning you can walk into the church and witness choristers singing from sheets of music that are 200 years old. And when you get close to it, even the paper the music is written on reveals a bit of its story.” Dr. Gordon went on to explain, “The choir members all held the music between their index finger and their thumb and their hands were often coated with seal oil. When the choir members held the music, the seal oil coming off their fingers left a colouration. Thus the manuscripts with the darkest thumbprints are the most used – the most popular.”

Regardless of how strong the musical legacy might still be, the 200 year-old paper is not. The sheets of music are physically deteriorating. “It is all literally crumbling in their hands,” said Dr. Gordon, a fact that has prompted efforts to preserve the collection. Dr. Gordon has spent parts of the last two summers in Labrador taking digital photos of all the sheets of music in an effort to document and catalogue the collection. Working from the digital photos, Sean Rice, Dr. Gordon’s student assistant in St. John’s, transcribes the handwritten music to electronic format using music notation software.

The computer program produces a musical score of each of the works, suitable for study or for performance. The new scores are then sent back to Labrador for editing of the Inuktitut texts. These will

eventually replace the original fragile copies, which can then be transferred to community archives and museums for preservation.

With the help of an Inuit research assistant, Lena Onalik, Dr. Gordon also started a dialogue with community elders about better preserving the manuscripts that are no longer in use in Hopedale and Makkovik. A Moravian church elder in Makkovik agreed with his suggestion that the sheet music, which was kept in an open cupboard on the porch of the church, be moved to the local museum. “She said a couple of years ago they had thought about throwing out the music because no one was using it anymore,” he said. While he was delighted the music was kept, “it drove home how short the memory is for what an important cultural legacy might be and how important it is to secure it.”

Securing this piece of Inuit history and culture for younger generations may prove to be a challenge. The sense of the importance of preserving the Moravian music comes from the few elders, now in their 70s and 80s, for whom the church was the cornerstone of their civic and religious life. “The understanding of the value of this cultural legacy within younger generations of Inuit is not the same. This is partly due to the effects of “southernization.” But there is also a sense among younger Inuit that this is music that was imposed from the outside: that it came from Europeans and, even though the Inuit became very

adept at it, the Moravian music superceded their own musical traditions. Inuit songs and dancing were actively discouraged by the missionaries and gradually seeped out of collective memory,” explained Dr. Gordon.

Other native traditions were lost with the historical intersection of European and Inuit culture. Their nomadic way of life in family groups was discouraged and the Inuit shifted toward a mission-centered existence. This close proximity with Europeans exposed the Inuit people to European diseases to which they had no immunity, most notably the 1918 Spanish flu epidemic which arrived with a Moravian supply ship and killed one third of the Labrador Inuit population.

An examination of the Moravian music in Labrador may well show how the Inuit influenced and changed European music over time. According to Dr. Gordon, throughout the 19th century, the Moravian missionaries frequently commented on the extraordinary aptitude the Inuit had for music and on how quickly they picked up instruments, learning to play the cello, the violin or the French horn very expertly. Yet over generations, the performance of music that started out as very European became something other than European. Successive “generations” of copies of the same composition are actually different pieces of music. Inuit musicians were effectively rewriting the music,

adapting it to their particular performing abilities and to their own conception of what is beautiful.

Examining the influence Inuit culture had on outside forces may prove timely at the start of another critical turning point in their history. The year 2004 marked the beginning of a new era of Inuit self-government over education, health and cultural affairs, pending the full ratification of the LIA settlement, expected in June 2005. “As the Inuit of Labrador assume responsibility for their governance, health care, education and cultural identity,” said Dr. Gordon, “any evidence we can bring to light regarding the impact they have already had on something as seemingly abstract as European music may offer some valuable lessons for the future.”

What started out for Dr. Gordon as a “list-making, museum project,” has quickly transformed into research with many possible outcomes. As an exercise in musical archaeology, it may well uncover insightful clues on how two cultures adapted to one another. At the heart, however, is a tale about the power of music-making that inspires Dr. Gordon to share it with others. “There is a fascinating and compelling story to be told – a totally improbable collision of cultures that took place in a corner of the world so obscure that few outside it ever noticed that it had happened. And yet, it remains, until this day, a part of the people’s lives in those communities. I think it’s an extraordinary story.” ■

FOR MORE ONLINE INFORMATION, VISIT: Newfoundland and Labrador Heritage Web site at: www.mun.ca/rels/morav/index.html

Dr. Hans Rollman, MUN Religious Studies, Moravian Mission's Web site at: www.heritage.nf.ca/society/moravian.html

Official Web site of the Labrador Inuit Association at: www.nunatsiavut.com/

The Moravian Music Foundation at: www.moravianmusic.org

NEW PARADIGM FOR STUDYING ABORIGINAL LANGUAGE

by Tracey Mills

CREATING A NEW RESEARCH

paradigm to study an oral language such as Cayuga is not an easy task, but Dr. Carrie Dyck of the Department of Linguistics at Memorial has always enjoyed a challenge. She has been awarded a Social Sciences and Humanities Research Council (SSHRC) grant in the amount of \$217,041 over a three-year period to do just that. Her project is part of a larger SSHRC pilot project that is seeking to recognize and acknowledge the contributions of traditional aboriginal knowledge.

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PROGRAM IN 1980.

The Cayuga language is part of the Iroquoian language family and is spoken by about 100 people in Six Nations, near Branford, Ontario. It carries with it an ancient and rich oral literary tradition that has had a major impact on developments in the field of linguistics, anthropology and philosophy. Because

there are not many young speakers of the language, it is endangered. But there is hope that this could turn around since the introduction of an immersion program in 1980.

Studying the Cayuga language is not a new interest for Dr. Dyck. She has been working on it since 1992 and helped create a dictionary which came out in 2002. Her interest in this particular language came as a result of meeting an interesting elder, Reg Henry who was a language activist and linguist noted for developing the Cayuga writing system. She worked with him for one year before his death and has been interested in the study of Cayuga ever since. Her involvement with the study of this language has led to good relationships with community members, most notably the Woodland Cultural Centre and its director, Amos Key, who is co-investigator on the project.

Although they received funding for the project in December 2004, there was a lot of preparation that had to be done before the project could get underway. The intense work began this past summer with the hiring of four transcribers and one summer co-ordinator, all of whom are Cayuga speakers. Most of the initial work on the project is taking place over the summers with transcribers working in July and August on tapes that are archived at the Woodland Cultural Centre.

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“SOME OF THE MATERIALS ARE QUITE SACRED AND PEOPLE ARE VERY SENSITIVE TO THIS. THEY WOULD NOT WANT THEM TO BE WIDELY PUBLICIZED AND HAVE ALREADY EXPRESSED FEAR OF THEIR SACRED RELIGIOUS TEXTS TURNING INTO NEW AGE CONCEPTS”

“The Cayuga language has an enormous oral literature starting with the most well-known Code of Handsome Lake from the Longhouse religion which takes a full 10 days to recite, in addition to an enormous amount of funeral speeches, legends and creation stories,” added Dr. Dyck.

For the first two years, most of the work will necessarily focus on transcribing a large mass of recordings with translations following in the fall and winter months. Numerous workshops will also be held throughout this time focusing on topics such as recording and transcribing Cayuga, spelling in Cayuga, ethical protocols and preliminary and literary translation. The workshops will be very helpful in getting the perspectives of the Cayuga elders as well as significant input from the community on the ethical issues involved in the maintenance of language.

The ethical considerations are crucial to a primarily oral language like Cayuga, according to Dr. Dyck.

“As soon as you are able to make language permanent in some form, either by writing it down or putting it on a computer, you have a blessing but also the problem of who gets to access the materials.

Some of the materials are quite sacred and people are very sensitive to this. They would not want them to be widely publicized and have already expressed fear of their sacred religious texts turning into new age concepts,” emphasized Dr. Dyck. “Obviously we need to closely consider who would have access and how to control access. It seems likely that some items may remain in the community while others will be shared with the outside.”

The predominant concern for the Cayuga people is the loss of control of their language and how to control what becomes of it once it is put out into the public domain. The problem of ethics is bringing up all kinds of questions that Dr. Dyck’s research project hopes to address over the next three years. She hopes her work will bring her closer to a Cayuga-informed perspective that will address these ethical protocols and steer the way to a new research paradigm for studying languages.

The primary goals of the project will be to first create a new research paradigm which outlines how to set down the Cayuga oral tradition and can be used as a model for other languages. And second to conduct research on written versions of Cayuga oral literature within this paradigm. In order to meet the second

goal, recordings of Cayuga will be written out and translated with the hope of producing deliverables at some future date. Some of these deliverables will include a Cayuga reader, an online dictionary of particles, and transcripts for curriculum development.


“I spoke to a lot of people involved in language preservation projects on how this project should be structured and as such there is a lot of community involvement,” said Dr. Dyck. “A lot of knowledge and expertise has been brought to the table and shared, that is probably the most significant achievement.” When asked what she has learned so far, Dr. Dyck praises the Cayuga elders and what they have added to the project.

“We brought in elders to act as consultants and they have brought so much to the project. Our research has become more of a dialogue and a participatory

activity. Cayuga speakers are a goldmine of linguistic data and there is so much to be learned by simply listening to them.”

As for the future of the project, Dr. Dyck hopes the project will create a talented group of young Cayuga speakers who know how to transcribe and work with various types of media to produce linguistic information. She also hopes to create the conditions where Cayuga language research can be done for and by the Cayuga people themselves with linguists acting as consultants as needed.

“This would help to ensure control of their oral language literature and ensure its long-term survival for many generations to come.” ■



MEMORIAL UNIVERSITY
PSYCHOLOGIST CAROLE
PETERSON IS HELPING
GIVE CHILDREN A VOICE.

OUT OF THE MOUTHS OF BABES

by Lisa Hoffe

IT WAS HER EARLY RESEARCH

on children's storytelling and how kids talk about real life events that led psychologist and researcher Dr. Carole Peterson to ponder the credibility of children's memory.

"Traditionally children have been considered very poor witnesses in court. Textbooks up to 1990 said that no child under the age of seven should be allowed in court because they couldn't tell the difference between fact and fantasy. So essentially, children had no voice and they couldn't tell their stories."

According to Dr. Peterson, at that time there was a widespread belief that if children were involved in an emotionally distressful event, they couldn't possibly talk about it with any kind of accuracy. Dr. Peterson also asked the same questions: "If they were really upset and crying during the incident, then aren't they going to make things up? Won't fantasy get mixed in?"

Her inquiry led to the quest to find an ethical way to interview such children as a way to document the accuracy of their memory.

She looked to incidents within her own family for the answer. "My own son had broken his arm when he was three, got lacerated when he was eight and had to be stitched up. A lot of times children are extremely upset by these events. Yet, these things happen on a regular basis with children."

She knew that more stories like this happened every day in the waiting room at the Janeway Children's Hospital Emergency in St. John's, the treatment centre for every child within a 100-kilometer radius of the capital city.

That's why every summer since 1993, Dr. Peterson posts a member of her team of student research assistants in the Janeway Emergency Room. They sit and wait for preschool aged children with these kinds of injuries to arrive.

"We approach the child's parent or guardian and explain the research to the family. But we don't interview them at the hospital because everybody's upset - the child and the parents. Instead we ask for permission to call them in a couple of days, and then go to their homes and interview both the child and the parent or guardian."

The researcher gives the family reading material about the study before following up a few days later by phone. "By the time we contact the family and explain in much more detail over the phone, they've had a chance to read the information and we can answer any questions they have. About 80 per cent of families grant us their permission and allow us to come to their home and interview the child about the incident. The co-operation we've had has been excellent."

Mindful of ethical concerns around the interviewing of children who are distressed, Dr. Peterson only

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questions those children in non-threatening accidents, not ongoing illnesses. “The nature of incidents range from burns, broken bones, trauma accidents requiring stitching to dog attacks or dog bites. The most common incidents are lacerations or bone fractures.”

“I’M ASTONISHED AT THE ACCURACY, EVEN THOUGH THE CHILD IS EXTREMELY UPSET.”

Researchers also interview the adult witnesses to document what happened to the child. “That is our gold standard of what happened,” said Dr. Peterson, “the adult witnesses occasionally make a mistake, but for the most part, when we have multiple adult witnesses we very seldom found them disagreeing about the incident.”

A member of Dr. Peterson’s team talks to the child immediately after the event, then again in six months or one, two, even five years later. Each time comparisons are made between the child’s recall of the incident with the record kept from adult witnesses.

Dr. Peterson said she was astonished at what she found. Though the children might have missed some of what happened, they were able to provide the main events of the incident with 90 per cent accuracy. Even five years later, their accuracy rates were 80 to 85 per cent.

“I’m astonished at the accuracy, even though the child is extremely upset. A lot of children were telling us what colour the facecloth was that was used to clean the blood from the injury.”

Children aged two and a half years of age also had “reasonable” memories. Two and five years after their distressful event, their recall was 70 per cent accurate.

Even those under two years of age were recruited for the study. However, the study found that the majority of children under two did not remember the incident. Those that did, generally amalgamated the incident with pieces of other events.

“Five years later, these children believed that what they were saying was an accurate account of what happened to them. In fact, there were pieces that were accurate but there were lots of things that had been brought in from other events.”

Peterson said as a consequence, she doesn’t have confidence in the accounts of children up to two and a half years old. “Children who are barely two years old forget. It’s also difficult to interview a two year old. They’re very busy. They’re hopping around the room. Children above two and a half were more co-operative in an interview situation.”

VULNERABLE TO POOR QUESTIONING

Dr. Peterson is quick to point out that her research study deals with children who are well questioned. “If they are well questioned, the accuracy is surprising,” she said. She stresses the importance of framing questions the right way when interviewing young children. It was a task for which her research assistants required training and it’s important for other people who interview children to keep in mind.

“People tend to think ‘yes’ or ‘no’ questions are simple questions for a preschooler. However, children will agree with you because they’re trying

to be helpful. So if you ask a question like, 'Is the sky purple?' They would often agree. Many of the questions asked by police officers are often yes or no questions. We found these are the wrong kind of questions for young children."

According to Dr. Peterson's study, children are in fact vulnerable to poor questioning. Instead of asking leading or coercive questions, she uses questions that start with "why": What happened? Who was there? What happened next?

The most accurate recall children have is called "free recall", which can be tapped by asking, "Tell me what happened."

"Older kids can give you very extensive answers. Younger children are not as good at free recall. It's better to ask preschoolers supplemental questions such as, 'Where were you? Who was there when it happened? What was the first thing that happened? What did you do then? Who was the first person that came to you? What were you doing? Where did you go? Where did they take you?'"

ONE OF A KIND RESEARCH

Here in eastern Newfoundland, a number of circumstances combine to make her work on childhood memory the only research of this kind in the world.

Every single child within a 100-kilometer radius of St. John's goes to the same place for medical treatment, regardless of economic circumstances or socio-economic status.

"I've had a number of colleagues in the U.S. who have tried to replicate this kind of research. Yet, the kind of

medical treatment in the U.S. depends very much on the child's social-economic status. To correct that in the research means covering many different medical centers at the same time which is very difficult to do."

GIVING CHILDREN A VOICE

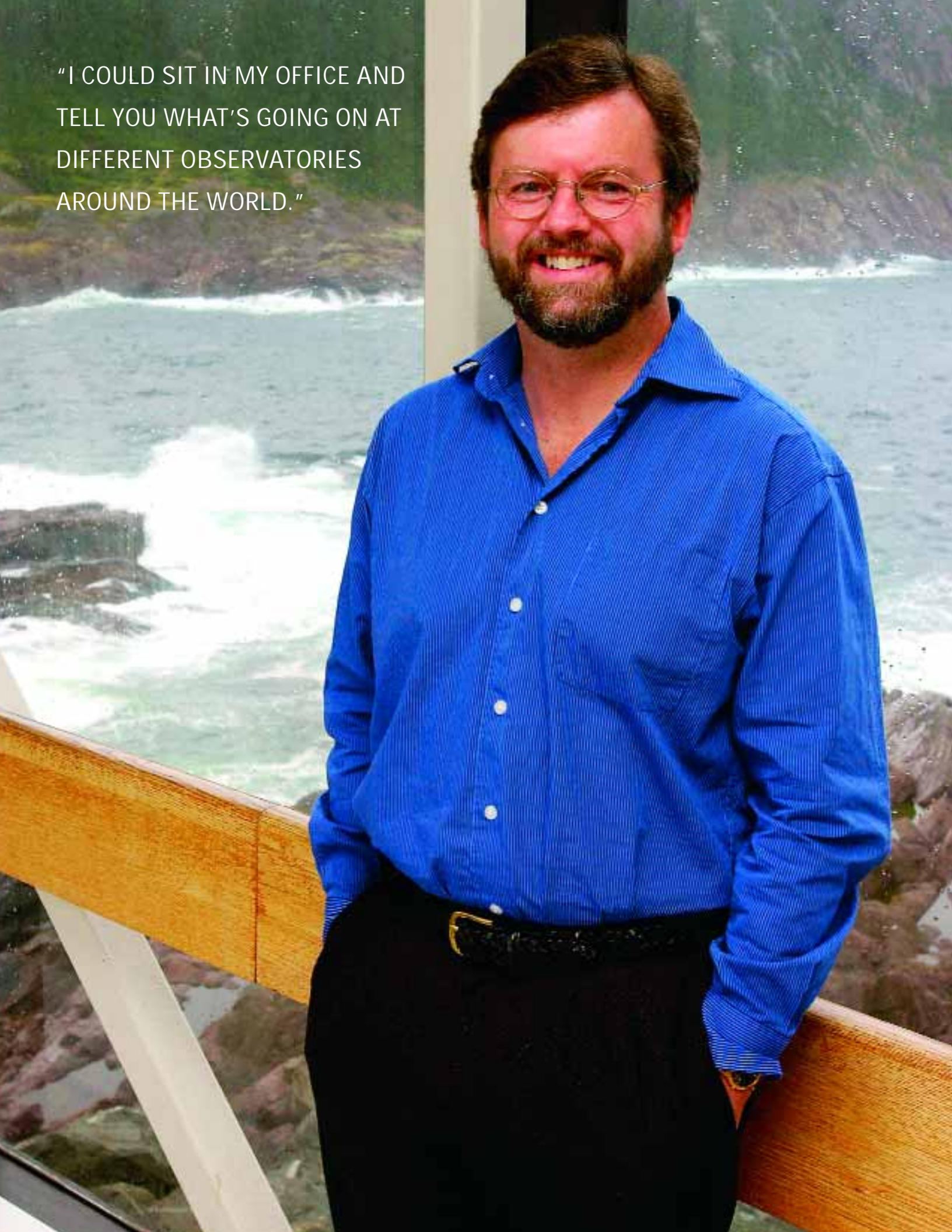
Dr. Peterson said her work is helping give children a voice. "Judges used to caution juries about how children were inherently problematic witnesses because they don't know the difference between lying and telling the truth." Now, as a consequence of the body of research to which Dr. Peterson is contributing, the Canadian Supreme Court ruled in 1989 and again in 1993 that judges cannot warn juries about the credibility of children's testimony. "Essentially, the jury has to come to its own judgment about the child's testimony."

Her research is also becoming widely known among police agencies. "I've been contacted by police departments from Tel Aviv to Tokyo. A member of the RCMP called me about the possible accuracy of interviewing a child who was abused at the age of 29 months and came forward three years later. Our data says yes, the child can be a very credible witness.

Peterson said her team has interviewed about 500 children since 1993 and the research continues today with follow up interviews seven years after a Janeway visit. Each time the results confirm Dr. Peterson's findings on the believability of children's eyewitness accounts.

"Children can be good witnesses. If they are well questioned, with good interviewing techniques, children are credible. They are reliable. We should believe them." ■

"I COULD SIT IN MY OFFICE AND
TELL YOU WHAT'S GOING ON AT
DIFFERENT OBSERVATORIES
AROUND THE WORLD."



GETTING THE BIG PICTURE ON OUR OCEANS

by Lisa Hoffe

Dr. Paul Snelgrove, Canada Research Chair in Boreal and Cold Ocean Systems, on why new approaches are needed in the study of oceans.

DR. PAUL SNELGROVE likens past oceanographic research methods to a movie theatre.

“Imagine you are walking by the theatre doors just as they momentarily open,” he said. “When you catch a glimpse of the screen it might be easy to tell what the movie is about if you’re walking by at a critical moment. But at another time, what’s on the screen may not tell you much about what’s going on.”

The same is true of the limitations of past oceanographic research. It can provide a clear window on the sea world, but a lot of what you see depends on whether the timing is right.

For example, every spring there’s a huge increase in the amount of plant material in the water, which is the starting point for the food chain, said Dr. Snelgrove. Then it sharply declines. Codfish, snow crab and many other marine species attempt to match the production and dispersal of their tiny larvae with the abundance of available food. But if the timing is not right the larvae may suffer higher mortality. “The exact cycle of food availability varies from one year to the next,” he said. “The bloom of plant material could be abundant in April one year and March or May the next, and this variability can propagate up the food chain to the organisms on which larval fish and other organisms depend for food.”

“As researchers we usually seek funding to acquire the use of a ship for a couple of weeks a year to do oceanographic research. We then go out to get a snapshot of that cycle to try and understand why some years are good and some are bad. But we’re playing this game where we try to catch these key events, some of which we know something about and others of which we may not have seen at all. And ultimately it’s a brief snapshot of what is in reality, a complicated movie.”

OCEAN OBSERVATORIES

One of the recent solutions created to advance oceanographic research is an ocean observatory. Fiber optic cables are sent to the sea floor and instruments are attached to the line. Two problems are solved: the instruments are connected to a power source and no longer operate on battery power, and the technology can also transmit data back to shore in real time. It is the sign of research methods to come. “In theory I could sit in my office and tell you what’s going on at different observatories around the world,” said Dr. Snelgrove, though he was quick to add, “We’re not quite there yet, but it will be a reality very soon. And it means we are no longer working with snapshots, but seeing the whole movie for the first time.”

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Memorial University has a small observatory at its Bonne Bay Marine Station, which is the first of its kind in Canada. The underwater station has a fiber optic communications and power cable link back to shore that allows scientists to further study the influence of the physical environment on the temporal variability of marine ecosystems. The instrumentation measures water properties and includes innovative video and acoustic technologies that permit the study of organisms that were previously poorly observed.

Led by Memorial University physicist, Dr. Brad de Young, the observatory involves a group of MUN scientists including chemists, physicists and biologists who are all interested in oceanographic processes.

One of the fundamental characteristics of oceanography is its integrated nature. "What happens with the physics has a huge effect on the chemistry and a huge effect on the biology. All these questions become intertwined. It's very difficult to address many biological questions in the oceans without knowing something about the physics, the chemistry and the geology. The greatest successes are coming by really building on this integration. And that is what we're trying to achieve in Bonne Bay."

Canada's second ocean observatory is located on the Pacific. VENUS or Victoria Experimental Network Under the Sea is a project of the University of Victoria, which started operating in the spring of 2005. VENUS has three fiber optic lines running out from Vancouver Island, which allows scientists like Dr. Snelgrove to stream data from VENUS to understand oceanographic processes there as compared to here in Newfoundland.

The vision of a network of observatories is getting closer for scientists with the advent of what Dr. Snelgrove calls the 'Big Kahuna' of ocean observatories – NEPTUNE or The North-East Pacific Time-Series Undersea Networked Experiments. Though this joint Canada-U.S. project is still in development, planning is underway to install a fiber optic line all the way around the Juan de Fuca Plate off Vancouver Island.

"From a geological perspective scientists are very interested because it helps them better understand plate tectonics, the slow movement of the plates that cover the Earth and cause earthquakes and tsunamis. But we are also enthused because we want to understand oceanographic variability in the deep ocean, which is very difficult and expensive to sample because it is so far away and so deep. Here is a mechanism by which we can stream data in real time once the observatory becomes operational," said Dr. Snelgrove.

Though ocean observatories are improving the quality of oceanographic research, Dr. Snelgrove also pointed out the limitations. One obvious challenge is the maintenance of marine instruments on the ocean floor that may become clogged or overgrown with living material. But there are other issues about the information collected. "We get very good data from observatories but typically at only one point in the ocean. So it's helpful to have a network of observatories. The way we're going to solve the problem in Bonne Bay is to complement our extremely good continuous data at one point with several clusters of ancillary sets of data that we'll collect in small boats or ships."

“IF THE WHOLE ECOSYSTEM STARTS TO COLLAPSE, THEN THE FISHERY, WHICH RELIES ON THE HEALTH OF THE ECOSYSTEM, WILL ALSO CHANGE – AND USUALLY FOR THE WORSE .”

A decade ago in the early 1990s, the first marine observatory was built off the coast of New Jersey. “Now there is a spreading network of observatories around the world that are coming online. In the U.S. there’s a handful in operation with more to come. Ideally scientists would like to have a broad network of these because some of the issues we need to look at are quite broad in scale. The El Nino phenomenon is a classic example of this.”

According to Dr. Snelgrove, thoughts on managing the oceans have shifted away from a single species perspective used in the past to a more holistic approach. “There is a belief now among many fisheries managers world-wide that simply focusing on one species and how its numbers change is not going to give us a very effective management tool. Here in Newfoundland, we know more about cod than any other marine species and yet it still collapsed under the management scheme that we had in place. Scientists are starting to look at the ecosystem level and use multi-species approaches to see how things interact and how they influence each other.”

Questions about ecosystem health arise from certain fishing practices that change the target species as well as the environment that fosters the species.

“Seamounts (underwater mountains) and sea grass beds are examples of environments that are particularly important to juvenile fish and shrimp

and other species. If you go out and fish off living structures that extend from the bottom, that’s critical habitat for these creatures,” said Dr. Snelgrove. “Dredging for scallops in sea grass beds allows the scallops to be harvested. But the sea grass habitat is also eliminated, and the scallops disappear.”

“If the whole ecosystem starts to collapse, then the fishery, which relies on the health of the ecosystem, will also change – and usually for the worse. We are doing some research, using tools like ocean observatories, to get at some of these cascading problems and questions of ecosystem health.”

Dr. Paul Snelgrove is also concerned about how little we know about the diversity of marine life in the world’s oceans, and he is taking an active role in addressing that. He is the Canadian Chair of a new international initiative called the Census for Marine Life, which bands together concerned oceanographers across the globe to take inventory of the huge portion of biodiversity in the oceans that have yet to be documented.

“Seventy per cent of the planet is covered by oceans. Estimates vary, but many scientists believe that less than 0.1 per cent of the species in the oceans have been sampled and described,” he said. “There’s so much biodiversity that we haven’t even documented.” ■

For more information on the above initiatives, visit: VENUS - <http://www.venus.uvic.ca/index.html>

NEPTUNE - <http://www.neptunecanada.ca/>

Bonne Bay Marine Station – www.bonnebay.mun.ca

Census for Marine Life – www.coml.org

photo by HSIMS



Members of the hemophilia research team include (L-R): Marc Kawaja, David Macgregor, Dr. Mary-Frances Scully, Michelle Hendry and Rose Ardern.



MANAGING MILD HEMOPHILIA A

by Sharon Gray

A TWO-YEAR STUDY on the clinical impact of mild hemophilia A among Newfoundland patients and their siblings is providing new information to assist doctors and patients to better understand and manage this hereditary bleeding disorder.

Dr. Mary-Frances Scully, a clinician and researcher in hemophilia at Memorial University, said preliminary results are already proving interesting. For example, the study of the female participants asked whether they had heavy menstrual periods or needed hysterectomies and then went on to study their iron stores. The researchers were surprised to find a high prevalence of sub-optimal iron stores and even iron deficiency in both women who are the carriers for the mutation and their unaffected siblings.

“Curiously, we did not find that this really affected these women’s quality of life although this has been found in many other studies,” said Dr. Scully. “It may well be that further, more sensitive studies, need to be performed. The very high prevalence of iron deficiency is quite alarming.”

Another concern raised by the study is a very high level of obesity in the affected males, their siblings, the affected carrier women and their siblings.

“Hemophilia not only predisposes the affected to arthritis and obesity but also increases the risk of arthritis,” explained Dr. Scully. “We are quite concerned with this combination because hemophilia predisposes to bleeding and many standard medications for arthritis also increase the risk of

bleeding. This makes it very difficult to manage the pain of arthritis in patients with hemophilia.”

Dr. Scully added that obesity also increases the risk of cardiovascular disease and that a mainstay of treatment of cardiovascular disease is with anti-platelet agents and anticoagulants. “The main side effects of these therapies are bleeding so they are difficult to use in patients with hemophilia.”

The prevalence of mild hemophilia A in Newfoundland and Labrador is believed to be the highest in the world, and one rural Newfoundland community with a population of around 3,000 has about 50 affected patients. Dr. Scully’s study involved 258 participants, including men with a genetic mutation that causes hemophilia as well as an equal number of their siblings, and female carriers and their siblings.

Dr. Scully believes that there are at least two separate genetic mutations in Newfoundland and Labrador responsible for mild hemophilia A. One, referred to as the “valine 2016” mutation, was identified by Memorial University molecular biologist Dr. Yagang Xie, in research he has done with Dr. David Lillicrap from Queen’s University in Kingston, Ontario.

Drs. Xie and Scully believe that there is another genetic mutation in Southern Labrador for hemophilia but this has not yet been confirmed.

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“IN PATIENTS WHO HAVE HAD PROBLEMS IN GENERAL THERE WAS A DELAY IN EITHER DIAGNOSIS OR IN TREATMENT AND THIS IS WHY THE HEMOPHILIA CLINIC TEAM REALLY WORK ON IDENTIFICATION, EDUCATION, PREVENTION, AND EARLY INTERVENTION.”

Dr. Scully's study also looked at the prevalence of Factor V Leiden and prothrombin gene mutation.

Dr. Xie has shown that there is a prevalence of Factor V Leiden mutation with five per cent of the population



of Newfoundland and Labrador heterozygote for Factor V Leiden and two per cent heterozygote for the prothrombin gene mutation.

“These mutations slightly increase the risk of clotting, however the size of our study was too small to ascertain whether or not these mutations decrease the risk of bleeding,” she said. “In

fact, some patients who have had significant bleeding are heterozygote for the Factor V Leiden mutation, therefore so far there is no evidence that this is protective in this hemophilia population.”

The study also showed that the quality of life of patients who became affected with hepatitis C through contamination of blood products was lower than patients who were hepatitis C negative.

“This shows again that maintaining a safe blood supply and really safe replacement therapy is of utmost importance. Fortunately Canadian Blood

Services in conjunction with all health care workers and the manufacturers of recombinant replacement products and other products for hemophilia are working hard to maintain high levels of safety and decrease the risk of viral transmission to almost zero.”

Analysis from the study shows that younger patients are doing much better. “In patients who have had problems in general there was a delay in either diagnosis or in treatment and this is why the hemophilia clinic team really work on identification, education and prevention, and early intervention,” said Dr. Scully. “Each patient receives a wallet-size ‘Factor First’ card which identifies their bleeding disorder, their level of factor, what product they respond to and the dosages they need in an emergency. The card also specifies what is a critical bleed and a minor bleed for the patient.”

This information is also kept on file so if a patient has to see a dentist, for example, to have a tooth pulled, a nurse at the hospital can access the information and forward it to the dentist in advance. For patients in rural areas, the information is sent to the local emergency department. ■

BRITISH TV CREW DRAWS ON MEMORIAL'S ICE EXPERTISE

by Michelle Osmond

THE LEGACY OF THE *TITANIC* is once again drawing media attention to this province, this time from the British Broadcasting Corporation (BBC). Cluny South is the BBC producer of *The Titanic Iceberg* and recently spent nearly four weeks in the province with cameraperson Justin Maguire. *The Titanic Iceberg* traced back the origins of this famous iceberg, recreating its life from Greenland's ice cap to its end, melting in the North Atlantic.



Photo credit: Justin Maguire & Cluny South

Dr. Claude Daley, professor and chair of Ocean and Naval Architectural Engineering at Memorial, was interviewed by the BBC crew. They were interested in Dr. Daley's description of what would have happened to the ice and to the hull when the Titanic struck the iceberg and to explain in general terms how icebergs get to the Grand Banks. They also had Dr. Daley recreate a high school science fair project his daughter did in Grade 11 that examined the changing shapes and instabilities of melting ice blocks (mimicking icebergs). The crew filmed a reconstruction of those tests with a Plexiglas tank. Ms. South said they came to Newfoundland because

of its history with icebergs. "This is where the icebergs come after Greenland. We could have gone to Labrador, I guess, but we were also keen to interview Claude and the IIP (International Ice Patrol), and Newfoundland being the last bit of land that the Titanic iceberg may have sighted convinced us this was the place for the last stages of our journey." "Unfortunately we came on a particularly bad year for icebergs," added Ms. South. "But our interviews here have been excellent – so much so that we are even considering coming back to do some more. Claude is a great storyteller and his enormous enthusiasm for his subject matter makes for a great contribution to the program."

Filming took place in the Engineering Building in the Fluids Laboratory, the Thermo Laboratory and in the welding shop in a lab where they reconstructed ice block tests. The crew and Dr. Daley also boarded a tour boat in Bay Bulls for a shoot that started around 5 p.m. and did not wrap up until 1:30 a.m. Dr. Daley didn't seem to mind the long schedule. "I was impressed by the whole process of making nature films – professional films in general," he said. "They are trying to tell a story in a way that will make difficult topics accessible to the public, and fun to watch. It is very different from academic/technical communication, but it has a similar rigour. They are very concerned about the integrity and logic of the work."

It's expected the story will air on BBC2 on a show called *Natural World* and on Discovery Channel sometime in the winter of 2005/06. ■

GETTING INTO A STICKY SITUATION

by Deborah Inkpen



Dr. Valerie Booth and the NMR spectrometer.

DR. VALERIE BOOTH, Canada Research Chair in Proteomics at Memorial University, found herself in a “sticky” situation when she began studying proteins, quite literally. That’s because she is studying proteins that are not soluble in water, but the kind associated with human cell membranes.

“Hydrophobic is a technical word for sticky,” said Dr. Booth with a laugh. “They are proteins designed to be embedded in your cell membranes, they don’t wander around loose, so that’s why they are sticky.”

She said that it’s important to study these proteins because if they are not functioning properly then you can develop a disease. “Genetic diseases occur because you have a protein that’s either not there or not functioning properly.”

Dr. Booth says that proteins are the body’s “molecular machines” and are central in the countless processes that maintain all living organisms. “A protein’s function comes about as a direct result of the particular features of its three-dimensional structure,” she said. “We need to know this structure in order to properly understand how a protein works, as

“PROTEINS ARE DESIGNED TO BE EMBEDDED IN YOUR CELL MEMBRANES, THEY DON’T WANDER AROUND LOOSE, SO THAT’S WHY THEY ARE STICKY.”

well as to design drugs to modify the protein's function to treat a disease. The details of this structure are too small to be seen directly, even in the most highly magnified images, and so we use techniques such as nuclear magnetic resonance (NMR) to determine the structure."

Dr. Booth recently received funding from the Canada Foundation for Innovation for a NMR spectrometer for high resolution structural studies of membrane proteins to assist with her research.

"It's labour-intensive doing the high resolution structures but it's the only way to get information that you need to rationally design a drug. Without rational design you are into screening millions of molecules for the activity you want, which also takes a lot of time," she said. "Proteins that are embedded in the cell's membrane constitute about one-third of all proteins and are especially important in health and disease.

These membrane-associated proteins pose unique technical challenges and relatively little is currently known about their structures. However, recent advances in both making the protein samples and using NMR to determine their structures mean that many membrane proteins are now amenable to structure determination for the very first time. In order to make the most of the NMR data, we combine this data with computer simulation. We use NMR and computational approaches to reveal the underlying mechanisms behind the function of several membrane-associated proteins."

Dr. Booth has also been working in collaboration with a local company, NewLab Clinical Research, which looks at identifying genes associated with human

disease. Currently Dr. Booth and NewLab are working on two proteins whose genes were found to be associated with psoriasis by NewLab in collaboration with Dr. Wayne Gulliver, clinical professor of dermatology at Memorial University. "I work with the protein that the gene codes for, to understand how it works and then to use the knowledge of the structure to help design a therapeutic to treat that disease," she said. "There's something very special about Newfoundland and Labrador and our possibilities for genetic research. We can identify a gene and say it's associated with this disease but what do we do with that? You can inform people that they are likely to get this disease and that may be of some help, but what we are doing is providing a connection between identifying a gene that's important in a disease and actually coming up with a drug that will treat a disease."

Dr. Booth and her team study proteins that are found in lung surfactants. "If you are born without the protein we study, which is called SP-B, you don't survive, you can't breathe," she explained. She said that about 15 years ago, hospitals began giving lung surfactants isolated from animals to premature babies with trouble breathing. It helped improve mortality. She hopes her research will result in the development of artificial therapeutics which will stay active longer and work more effectively.

"First, we are looking to understand how the proteins work, and second, we can use the knowledge so that we can design therapeutics. The drugs designed based on this knowledge can either act to replace a missing protein or to modify the function of a protein that's not doing what it's supposed to, thereby treating the disease." ■

INCO INNOVATION CENTRE OPENS



REPRESENTATIVES of Memorial University, the provincial and federal governments and Inco Ltd. officially opened the Inco Innovation Centre, a new \$17.3 million research and innovation facility located on the university's St. John's campus on Sept. 20, 2005.

The impressive-looking glass and steel edifice, built over the structure of a defunct student centre, represents the university's vigorous commitment to innovation in research and teaching; the new facility will also enhance Memorial's community-oriented focus.

Inco Ltd. committed \$13 million towards the capital cost of the facility and \$1 million annually for seven years for operations and maintenance. The federal government – through \$13.1 million announced in 2003 under the Atlantic Canada Opportunities Agency's Atlantic Innovation Fund (AIF) and an additional \$10 million announced Tuesday under the agency's Business Development Program – has invested over \$23.1 million in support of ongoing research and development in the centre.

Containing some 9,000 square metres, the Inco Innovation Centre houses a wide range of research, business support and educational facilities on three floors. Research related to geosciences, hydro-metallurgy and the Voisey's Bay mineral deposit will be concentrated on the first floor of the building. The first floor contains labs for health, safety and risk engineering, and process engineering and corrosion reduction. The centre was also designed to house a small scale model of a hydrometallurgical plant. Memorial's president, Dr. Axel Meisen, stressed the significance of the bright new structure at the centre of the campus.

"The Inco Innovation Centre is a beautiful new facility, but the true value of the new building will come from the innovations that the centre will foster at Memorial," he said.

"Thanks to the generosity and vision of Inco and the government of Canada, the Voisey's Bay deposit will not only provide the jobs and economic growth one would typically expect, but will also pay other critically important dividends for the people of

“OUR VOISEY’S BAY PROJECT HAS DEMANDED SOME OF THE MOST INNOVATIVE PARTNERSHIPS THIS COUNTRY HAS EVER SEEN AMONG PRIVATE INDUSTRY, GOVERNMENT, ABORIGINAL PEOPLES AND EDUCATIONAL INSTITUTIONS LIKE MEMORIAL UNIVERSITY.”

Newfoundland and Labrador by making Memorial University a stronger, more research intensive and innovative institution.”

“Inco is extremely proud to be associated with Memorial,” said Scott Hand, chairman and CEO of Inco Ltd. “Our Voisey’s Bay project has demanded some of the most innovative partnerships this country has ever seen among private industry, government, aboriginal peoples and educational institutions like Memorial University. We believe that this centre will help to foster and promote the kind of partnerships and innovation that have made Voisey’s Bay possible; not just technical innovation, but social, political and economic innovation as well.”

“The \$23.1 million in federal support for this project is a worthwhile investment on many levels,” said Todd Russell, member of Parliament for Labrador on behalf of Joseph McGuire, minister of the Atlantic Canada Opportunities Agency.

“It is worthwhile in terms of meeting the Government of Canada’s commitment to the Voisey’s Bay Development, increasing Memorial University’s research and development capabilities, and maximizing economic benefits associated with the project. It also underscores the Government of Canada’s commitment to increasing the amount of R&D funding available in Atlantic Canada.”

“This is truly a centre for innovation, for invention, for creativity – and I can’t think of a better place for this facility than Newfoundland and Labrador,” said Tom Hedderson, former minister of education.

“This centre is good for industry leaders, researchers and students alike. As minister of education, I am particularly impressed with what it will offer the students. Indeed, I would hope that this centre will lure the best and brightest students from around the world to Memorial.”

Operations at the new facility will not be restricted to the mining industry. The Inco Innovation Centre will also play a role in social science research and knowledge transfer.

For example, the facility houses the offices of Dr. David Natcher, the Canada Research Chair in Aboriginal Studies, and the Centre for Aboriginal Research. In his research, Dr. Natcher is exploring alternative models of community development that take into account not only Labrador’s commercial development versus the subsistence needs of its aboriginal peoples, but also other factors such as aboriginal health, nutritional status, educational achievement, access to desired resources, and aboriginal rights. ■



Photo credit: Harry Ransom Centre

THE SHORTHAND LANGUAGE OF POSTCARDS

WISH YOU WERE HERE: we've all written or read this line on a postcard. But many of us haven't looked closely at how the postcard has changed our everyday language or shaped modern literature. Dr. Bradley Clissold, a faculty member in Memorial's Department of English is hoping his research into postcards written in the late 19th and early 20th century will showcase how these vehicles of modern communication have influenced how we currently read and write more than 100 years later.

"Postcards have a shorthand language specific to their materiality," says Dr. Clissold. "The origins of the picture postcard date back to the 1860s, and even though this form of modern communication has been surpassed by more technologically efficient means, the postcard has not been replaced. It retains its cultural currency as an easy and inexpensive communication medium, and over the past 140 years the postcard has continued to evolve as a cultural touchstone and historical register."

Dr. Clissold recently received an Andrew W. Mellon research fellowship to conduct research at the Harry Ransom Center, a cultural archive that houses over 36 million literary manuscripts, including a copy of the first Gutenberg Bible. He will spend two months at the center in Austin, Texas, to study their collections of postcards. His focus will be, in part, on the ways in which postcards exist as neglected precursors to the shorthand language used in text messaging and e-mail.

"I am looking at the ways language gets modified by these types of technologies and different materialities. People have not really explored how the postcard (and the telegram before it) helped to initiate a silent revolution in everyday linguistic practices and did so in a very popular and democratic way." For Dr. Clissold, another important aspect of this project is that it helps to preserve postcards as valuable archival resources for future generations of scholars. "There is finally a slow but growing trend among postcard collectors and archivists to no longer dismiss the

“YOU CAN’T HIDE ANYTHING ON POSTCARDS. IT’S AN OPEN FORM OF CORRESPONDENCE.”

‘postally used’ postcard as devalued and worthless,” he says. “Through my research, I hope to generate a greater appreciation for the value of postcard writing and reading, and encourage the preservation of these artifacts of cultural identity.”

He is also connecting the language of postcards to literary movements in the beginning of the 20th century. “Literary authors were experimenting with language fragmentation and abbreviation in literature in ways that are very similar to the messages written on postcards by postcard writers,” he explains. “A lot of modernist literature, which roughly dates from 1890 to 1939, is considered elitist and esoteric – a literature apparently designed only for a very sophisticated, hyper-educated specialist who could decipher such experimental works.” Dr. Clissold argues that the “same types of fragmentation and truncation of language that appear in modernist literature were commonly practiced on postcards by many everyday users of postcards.” He added, “The same types of language-play were being used at both this high end of esthetic production and at this so-called low end of daily communication, so I am trying to unite these two fields of cultural practice to argue that if people could deal with postcard forms, they could, in theory at least, deal with the more experimental linguistic forms of modernist literature.” This claim allows Clissold to challenge the misrepresentation of modernist literature as cultic and not written for the “common” reader.

“You can’t hide anything on postcards. It’s an open form of correspondence: the mailman, if you had servants, any third party who comes into contact with them can read them – and most do,” says Dr. Clissold. “As a result, one often finds coded messages and

private language games on inscribed postcards, which is also reminiscent of some of Modernism’s more experimental authors.” He adds, “This work is part of a larger book project, *Exchanging Postcards: Vernacular Modernism and the Field of Cultural Reception*, which attempts to read the postcard as a popular material support for early 20th century literary esthetics by focusing on how the postcard functioned as a practical application for the production and reception of Anglo-American modernist experiments in linguistic and literary form. Postcards, because of their material constraints – their size and the public nature of their messages – became a workshop for linguistic innovation, and thereby helped to establish the tolerable limits of experimental modernist poetics. They also helped to prepare an audience for modernist works by challenging conventional reception practices years before most modernist writers set out to subvert and exploit those very practices. Modernist figures like James Joyce, Virginia Woolf, Evelyn Waugh, Ezra Pound, and E.E. Cummings not only used postcard correspondence to exchange ideas, but also exploited the affinities between postcard communication and literary production in their development of high modernist esthetics.”

“From their beginnings alongside the postal reforms of the 19th century, postcards quickly became symbols of modernity: the spirit of the age – brevity and speed. They were, according to one social critic of the period, ‘a sign of the times’ that made available a fragmented and effective means of interpersonal communication to ‘a hurried generation that has not many minutes to spare for writing to friends’.”
Weather good. Miss all. Ciao! ■



**FOR MORE INFORMATION ON RESEARCH
AND PARTNERSHIP OPPORTUNITIES, CONTACT:**

Office of the Vice-President (Research)

Memorial University of Newfoundland

St. John's, NL A1C 5S7 Canada

Phone: (709) 737-2530

Fax: (709) 737-2552

research@mun.ca

www.mun.ca/research

025 103 12 05 2,000



Memorial
University of Newfoundland