

is grateful to Saint Mary's and CCEPA for their help.

Below are position statements from some of the invited participants.

ACADEMIC FREEDOM TO TEACH INDIGENOUS SCIENCES

Root Gorelick

Academic freedom should provide us, certainly faculty members in science, the option to teach Indigenous sciences. Academic freedom should also provide us the option to not teach Indigenous sciences. We were not hired to convey facts to students – they can look that up on their cellphones – but rather to teach them how to think and expose them to a diverse suite of ideas. There is a fairly rigorous filter to obtain a tenure-track university position. Once we hire someone, and especially after they earn tenure, shouldn't we trust them to do the right thing? That is partially what academic freedom means to me.

Teaching of Indigenous sciences, however, raises other tantalizing questions. What are Indigenous sciences? Why teach Indigenous sciences? What do Indigenous sciences contribute to knowledge that we cannot garner from western sciences? How can we promote teaching of Indigenous sciences?

These questions arose when I tried offering a course in "Indigenous perspectives ecology and evolution". While I could and have interjected bits of Indigenous ways of knowing into routinely offered biology courses, my request was for a standalone biology course in this subject. My request was rejected, with the following rationale, "There were serious concerns about creating a precedent for 'Science' courses based on mythological and folklore traditions." Note the capitalized monolithic "Science" in scare quotes. Ironically, western science is full of myth and folklore. In London, the Royal Society was founded to study the occult, especially alchemy. Wealthy bankers stood to lose if a commoner could turn "base" metals into gold. Newton's theory of gravity was occult. The four humours and much

SYMPOSIUM ON PSEUDO-SCIENCE AND ACADEMIC FREEDOM

Academic freedom enables professors to speak and teach the truth as they hold it to be. But what if the truth as they hold it to be is not only false but dangerous? Should academic freedom still protect them?

In early November, 2016, scholars from across Canada came to Saint Mary's University, in Halifax, to debate different answers to this question.

The symposium was organized by SAFS and sponsored by both SAFS (through a generous donation by Chris Furedy in memory of John Furedy) and Saint Mary's University, with logistical support from the Canadian Centre for Ethics in Public Affairs. SAFS

of modern medicine are still based on occult theories. Research in evolution of sex is pervaded by its own creation myths and folklore, such as that sex increases genetic diversity. This myth was created 125 years ago to rescue Darwin's theory of evolution by natural selection, even though we have subsequently accumulated a preponderance of evidence showing just the opposite, that sex reduces genetic diversity.

I use the plural "Indigenous sciences" because each local culture developed its own science in order to survive and thrive. Appending the modifier "Indigenous" to "science" seems no more nor less justified than appending the following other modifiers to "science": *social, natural, hard, Marxist, biological, political*. Not being Indigenous, I am reluctant to state what "Indigenous" means when appended to the noun "science", especially when most North American (Turtle Island) languages are verb-based. My rudimentary knowledge of Turtle Island Indigenous sciences, however, indicates that we can often make the following generalizations:

Western science	Indigenous sciences
global	local
analysis	synthesis
disaggregated	aggregated
entities	relationships
linear time	cyclical time
experiments	observations
detachment	observer part of observed

These differences are more than just in perspective – they are the axiomatic framework with which people begin their questioning of the natural world. They are the prior beliefs, the prejudices, and the creation stories that we all have. They are like the few core words in a dictionary that cannot be defined by other words. These differences really matter if you consider science to be any field with repeated Bayesian updating, i.e. any discipline that is evidence-based.

Bayesian updating means applying Bayes theorem, which was mostly developed for military and gambling applications. But the idea behind Bayesian up-

dating is simple. Start with a prior belief about the world, collect data to test that belief, and update your belief based on the data. Bayes theorem provides a way to do this updating if the prior and posterior beliefs are probabilities of a state of nature, which is a fairly standard conceptualization. Western and Indigenous sciences start with different prior beliefs. Hence, even if given the same data, their updated beliefs will usually be different. While admittedly a western conceptualization of science, this explains how people can maintain differing views even when presented with the same evidence.

Geometry provides a nice analogy. Euclid laid out a suite of axioms for doing geometry on a two-dimensional infinite plane, including the parallel postulate, which states that given a line and a point not on the line, then only one other line, a "parallel line", can be drawn through the point that does not intersect that original line. Indigenous ways of knowing are analogous to non-Euclidean geometry, in which either zero parallel lines or an infinite number of parallel lines exist. None of these geometries are right or wrong; but they can be complementary. Similarly, quantum physics has both the Copenhagen convention and multiverse models, which are simply different ways of knowing, neither being right nor wrong, but telling us different things in the face of identical data.

Like Bayesian analysis, the U.S. military also gave the world Thomas Kuhn, whose philosophy of science revolved around problem solving. The best way to solve any problem is usually to throw a suite of methods at it, hoping that something works. Therefore, to solve a problem in science, why not throw lots of methods at it, including those from western and Indigenous sciences? Our students will be better prepared for the world if we introduce them to such tools.

We can promote teaching of Indigenous sciences by hiring people who study them. This increased diversity of ideas will benefit our teaching and research. It would be great if those hired were Indigenous, but this probably cannot be required. Likewise, I advocate that we hire people who teach and research fem-

inist science, queer science, etc. Then let academic freedom work!

Root Gorelick is a professor of biology at Carleton University, in Ottawa, specializing in evolutionary theory. He is cross-appointed in mathematics & statistics and in interdisciplinary studies. Though he had long been an advocate for due process, equal protection, and free speech, Dr Gorelick had not thought much about academic freedom until becoming a faculty representative on Carleton's board of governors, in 2013.