From 'Critical Events' to Consciousness – An Autobiographical Journey

by

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Abstract

This dissertation documents a journey of self-reflection and self-discovery, which ultimately leads to a change in worldview. The purpose of the thesis, therefore, is to provide a process for this journey. Initially, the author uses an autoethnographic approach to understand feelings of confusion and disillusionment with the school system that are sparked once she begins her sojourn as a doctoral student. By applying the metaphor of a map to make sense of her predicament, she identifies and analyzes the key turning points, or *critical events*, along her path to come to a fuller understanding of herself and her emotions, while paying particular attention to the construction of scientific knowledge, which she learns plays a very important role in the resolution of her internal conflict. She invites the contributions of *critical friends* who help her realize that, not only do critical events share common elements, they also possess the potential to increase one's awareness, and hence consciousness.

At that moment, she determines that a more in-depth pursuit and examination of her own process is required and therefore feels compelled to abandon the ethnographic aspect of her enquiry. She maintains the thread of self-study, however, as she migrates toward an individualized conception of autobiographical narrative enquiry. She yearns to move beyond the modern science paradigm for answers, and so explores current developments in consciousness studies, as well as Eastern and Indigenous traditions. This motivates her to seek the intersection between spirituality and science, which she feels is lacking from the Newtonian worldview. During her search, she starts to see that her doctoral study fits the parameters of a critical event. It also becomes apparent that by articulating her methodology, her process might even prove helpful for others. She concludes her analysis by proposing that we adopt a *perennial philosophy of science,* which embraces pluralist perspectives and characterizes what she terms a "Terrestrial worldview."

Keywords: School system; science; consciousness; spirituality; pluralist perspectives; paradigm shift

For my brother Tom

Acknowledgements

"If it is in the highest good for all of life everywhere."
~ Australian First Peoples (cited in Morgan, 1995)

As reminded by the Australian First Peoples, I offer this dissertation *if it is in the highest good for all of life everywhere*. I also wish to express my gratitude to Mother Earth and all her inhabitants for their contributions to the success of this thesis. I'd like to acknowledge my Higher Self for inspiring the words that have passed through me and onto these pages.

I am deeply grateful for the love and support of my husband, Rob, without whose nourishment and coaching, this endeavour would not be possible. I also want to recognize the editing talents of my brother, Christopher, which have contributed significantly to the quality of this dissertation. Certainly, I would not be where I am today without the wonderful start in life and continued encouragement I receive from my parents, Willard and Marlene Teed.

With sincerest thanks, I honour those special *Critical Friends* in my life who found this project worthy of their time and contribution. Your open hearts and willingness to share were great blessings bestowed upon me. For this, I am eternally grateful. I'd also like to express my appreciation to all those friends who heeded my instructions to refrain from contact while I worked incommunicado for weeks on end.

Of course, none of this would have come to fruition without the inspirational guidance of my supervisory team. I am extremely fortunate to have found three amazing men who offered me their wisdom and patience. It is with the utmost gratitude and respect that I recognize David Zandvliet, Allan McKinnon, and Philip Balcaen, whose insight and advice forced me to stretch myself in the most wonderful ways.

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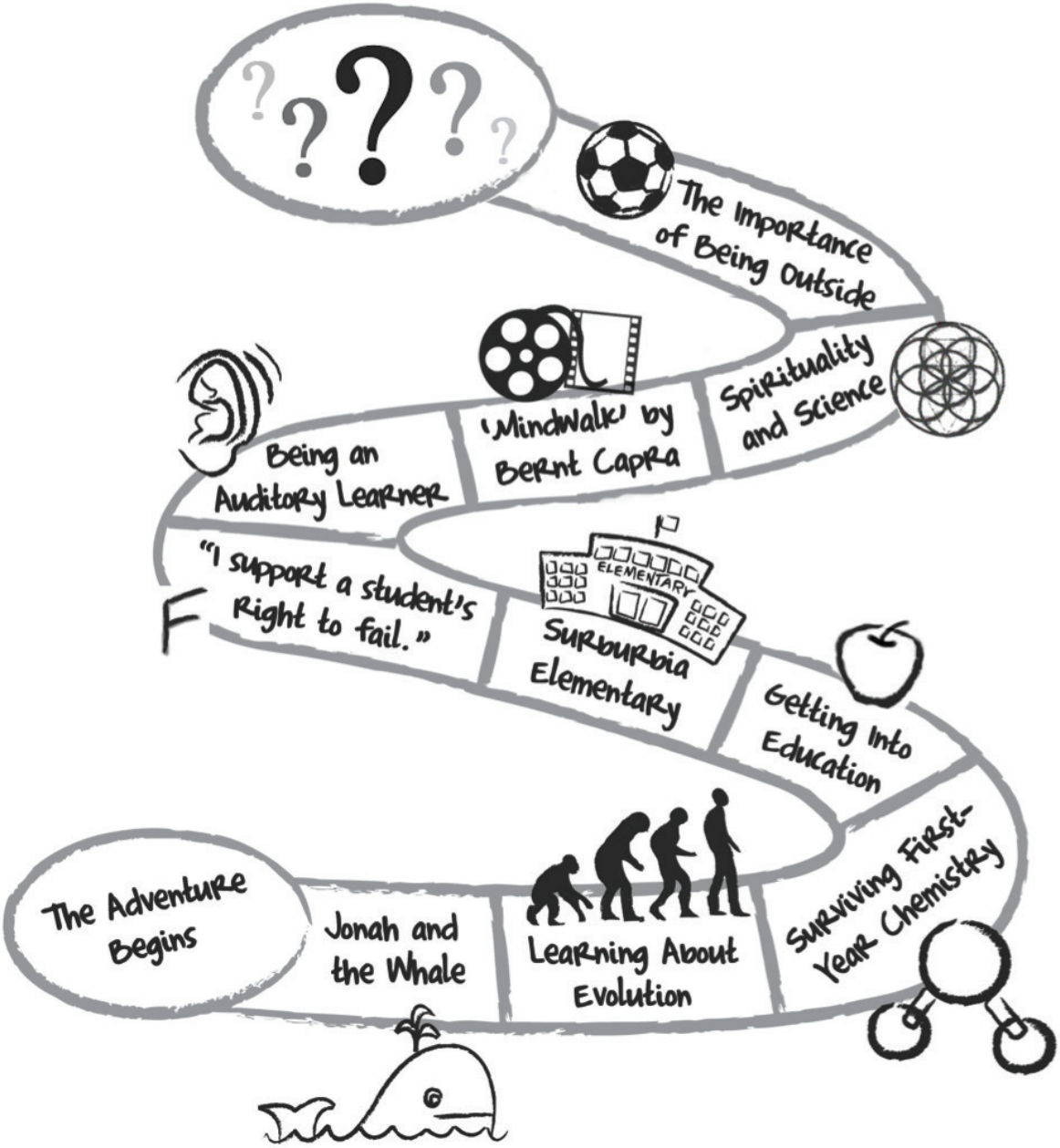
List of Acronyms

BC	Before Christ
B.C.E.	Before the Common Era
CIA	Central Intelligence Agency
EEG	Electroencephalography
ET	Extra-Terrestrial
NDE	Near Death Experience
UFO	Unidentified Flying Object

Mapping the Journey

"Congratulations! Today is your day.
You're off to Great Places! You're off and away!"
~ Dr. Seuss (1990, p. 1)



Chapter 1.

Introduction

"The act of telling a personal story is a way of giving voice to experiences that are shrouded in secrecy."
~ Ellis and Bochner (1992, p.79)

This dissertation begins with a critique of the school system from the author's perspective as a student, a science teacher, and a teacher educator. It also documents how an expansion in awareness regarding developments in modern science eventually transforms into an exploration of self-discovery; one that resolves an inner yearning to reunite science and spirituality within the western science context. Although initially, I approach the thesis as an autoethnography, it evolves into an autobiographical narrative enquiry in which I record personal experiences and reflections that eventually compel me to leave the school system. I contextualize these experiences and reflections using pertinent literature from a number of fields of enquiry, including education, science, and philosophy. Analysis of the events leading up to my departure prompt me to examine such fundamental concepts as self, knowledge, and consciousness, which ultimately lead to the adoption of a new worldview. What this thesis offers is a unique approach to looking at one's personal growth based on these emergent ideas; as such, the contribution of the work might be understood as a different way to think about the school system, with particular emphasis on the construction of scientific knowledge.

My name is Susan and this is my journey.

The Person Behind the Voice

As you will soon discover, this dissertation reads more like a one-sided conversation than a traditional, academic piece. This is intentional for several reasons. Most importantly, I mean to be transparent about which are *my* thoughts and ideas and which belong to others. Transparency may seem a trivial thing to address here, but in my mind, we as teachers have too long confused students about the *essence* of teachings and *our interpretation* of them. That is, I believe teachers convey their own understanding of concepts as they teach them to students who may not possess the intellectual capacity to understand the nature of this exchange. As a result, students may also mistake what teachers say as correct and absolute, whether or not teachers have accurately captured the authentic *essence* of the original teaching.

Science education is a perfect case in point. For instance, whenever a science teacher explains a concept, like "Heisenberg's Uncertainty Principle" (Heisenberg, 1949), without invoking questions or critical thinking he or she risks conveying a personal understanding of this principle. As a result, students' understanding of the topic more closely resembles a *moral of the story* interpretation like that from a religious sermon. I therefore contend that first-hand engagement through examining, applying, and challenging what was taught would be a better use of time and allow students to learn how to distinguish between the teachings, the teacher, and their own understanding.

Therefore, it is my hope that *my* voice and *who I am* as a person will come through in this informal writing style so that the reader has a clear sense of whose thoughts I am representing. With a bit of luck, it might also appeal to my family, who really have no idea how I have been spending the last six years as a doctoral student. It would bring me great joy knowing that they may one day read and enjoy the fruits of this gigantic undertaking. And secretly, while I know it won't make any book-club reading lists, I wonder if it might be found during an Internet search by some unsuspecting person who discovers she or he shares some of the same thoughts,

feelings or experiences I do. Finally, as liberal and reckless (and uncomfortable) as it may seem to write with such informality, I am guided by the principles of autobiographical narrative enquiry, which thankfully invites research sharing in the form of a first-person narrative. And of course, if it weren't for the wonderful support of my advisory committee, I would not have proceeded with such confidence.

(Consider reading *More About the Author* found in Appendix A to gain further insight into this person behind the voice.)

Ignorance is Bliss

I was a seasoned teacher of 17 years when I began my doctoral studies in science education. Even before I started the program, I had already worked out the details of my research, which involved using controversy as a teaching strategy to actively engage students in critical thinking. It was a concept I had been applying in my teaching for years – one that grew out of a compelling need for me to shake students, and candidate-teachers in particular, out of what I perceived to be a 'zombie-like' state (which, in my estimation, was an adaptation they developed to survive in the school system). Quite by accident, I discovered that there were several ways to achieve this: by making outrageous statements, by claiming to students that I had no idea what I was talking about, or by professing that anything I didn't know, I tended to make up. Surprisingly, I found this to be a powerful way to initiate the active engagement I had been seeking.

According to social psychologist, Leon Festinger, I was creating a form of "cognitive dissonance" for my students, which was something I discovered that I really enjoyed doing. Apparently, without such experiences of psychological discomfort, "there would be no motivation [...] to seek out new or additional information" (Festinger, 1957, p. 127). It was certainly interesting to ponder that I was using psychological discomfort to generate opportunities for learning. To me it sounded

controversial when I thought about my approach in that way. In Piagetian terms, it could be called "disequilibrium" (Piaget & Garcia, 1989), a softer, less intimidating term in my opinion. When this happens, and I can attest, people are obliged to respond by attempting to return to a state of balance. Thankfully, "In trying to overcome disequilibrium – here perturbations, errors, mistakes, confusions – the student reorganizes with more insight and on a higher level than previously attained" (Doll, 1993, pp. 82-83). I concur! I witnessed displays of critical thinking and engagement involving self-initiated exploration and problem solving that did not take place when I delivered information in a lecture-style format. Ironically, I too found myself in various states of disequilibrium as I embarked on the use of controversy as a teaching tool.

Perhaps even more encouraging was the work of adult educator, Jack Mezirow, and his notion of "transformative learning" (1998, 2003). For he came to the conclusion that if students were able to return to a state of equilibrium by overcoming what he terms a "disorienting dilemma," the experience could result in personal *transformation*. That definitely sounded promising. It involved critical reflection of assumptions in which individuals were able to free themselves from "cultural canons (frames of reference held in common)" (Mezirow, 1998, p. 191). In addition, if one could address the "problematic frames of reference (mindsets, habits of mind, meaning perspectives) – sets of assumption and expectation – to make them more inclusive, discriminating, open, reflective and emotionally able to change" (Mezirow, 2003, p. 58), I just might be able to defend my controversial teaching style based on its transformative potential.

Having been so totally convinced of the beneficial effects of cognitive dissonance and disequilibrium, I decided the strategy was worthy of investigation, and so began to carry out what became the first of my doctoral study plans, which I entitled, *Using Controversy as a Teaching Tool*. It incorporated surveys of 32 high-school science candidate-teachers' attitudes toward my use of controversy during the weekly activities of our science methods course. I investigated ongoing growth and development

regarding the strategy throughout the course via small group interviews. And most importantly, I attempted to measure the overall effects of firsthand experiences of controversy by candidate-teachers in the course to see what promise it held as a teaching tool.

In retrospect, I was so motivated to accomplish the task, I had already gone through the rigours of obtaining ethics approval and completed the entire study halfway through the doctoral coursework. This is not how it's usually done. Normally, you finish your courses, write your *comps* (meaning comprehensive exams) as they're known among grad students, then add "PhD candidate" to your name before you begin to pin down your research topic. I was clearly fast-tracking myself to avoid becoming one of those graduate fatalities who slowly disappears into oblivion having completed "all but the dissertation" (ABD), which urban legend maintains is holding steady at 50%.

Based on what I've shared so far, it would be logical to assume that the remainder of this dissertation details how I carried out the research above. I may as well break the news to you now and reveal that almost immediately following the events of the earlier paragraphs, my life turned upside down. So despite the foundation I've already laid, let's begin again. This time, I will explain what led up to the 'derailment' of and subsequent departure from the controversy study and how the new direction of my doctoral research ended up taking its place.

My Tail-spin

Being so early into this dissertation, I haven't been able to sufficiently elaborate on the recurring themes (e.g., naïveté) that kept popping up in my life. So I begin with an example in which I felt I had things well in hand and my life was progressing exactly as I had hoped – circa 2008. I was on track with the aforementioned research proposal, *Using Controversy as a Teaching Tool*, my husband and I were moving to Vancouver

Island, and I was hired for a position teaching science education courses at a university there. I found it all too good to be true.

Contrary to the seemingly happy exterior to my life, I suddenly felt as though the ground was slipping beneath my feet, or as Festinger would say, I was experiencing cognitive dissonance. It caught me off-guard and unprepared for the circumstances that quickly plucked me out of my day-to-day existence, which soon brought feelings of despondence and confusion. Most unfortunately, it set me into a tail-spin, and it happened during my doctoral coursework. When it came on, I entered a *thick fog of uncertainty* as I felt the conviction for my chosen profession begin to fade. At the time, I was teaching grade 4 students by day and candidate-teachers of science one evening each week.

Since much of this story will be provided later, I present only a few of the necessary details here. Most importantly, I began to develop an increasing sense of unease about teaching as aspects of the school system of which I had not been previously aware were brought to my attention. One might say I was highly sensitive to learning things I felt I ought to have known; reminiscent of a similar situation that took place in a Grade 12 religion class when I discovered I was the only one who believed Jonah was *actually* swallowed by a whale (detailed in a journal entry entitled, *Jonah and the Whale,* found in Appendix B). While I realize it may sound like an extreme and perhaps *over*reaction to finding out information about the school system, which I could have discovered at any point during my career, I hope as you continue reading you'll come to understand why I responded so strongly.

The first, and possibly most profound of my discoveries, was learning that the original design of schools had barely changed since the 19th century when Horace Mann proposed a restructuring of the one-room schoolhouse: "children are divided according to ages and attainments, and a single teacher has the charge only of a single class" (as cited in Pratt, 1986, p. 112). The layout of multi-room schools became known as the

"factory model" (English, 2005), initiated in the mid-1800s in an effort to capitalize on large-scale productivity and efficiency. This model was intended to guarantee the value of its manufactured goods, in this case *children*, by employing quality-control measures, otherwise known as standardized tests (Serafini, 2002). Through the use of scientific testing, the effectiveness of a student, teacher, and institution could be measured. This metaphor turned teaching into 'assembly lines', administrators into 'business managers', and student performances into 'efficiency' and 'compliance.'

On a personal level, suddenly things were making sense. I now understood why there were 30 students in my classroom under the age of 10 and I was the only adult. Such a ratio would increase efficiency from both an educational and financial standpoint. At least this might be the case if it were still the mid-19th century when these ideas were first conceived. However, in my opinion, such outdated notions in no way satisfied the needs of my 21st-century classroom! I could not help but envision my nine- and ten-year old students passing me on conveyor belts, which made returning to the grade 4 portable on a daily basis seem almost unbearable. Needless to say, exposure to such ideas at that point in my career had a devastating effect.

Reading Freire's *Pedagogy of the Oppressed* only intensified my discomfort. His use of a banking metaphor to describe school, whereby teaching becomes an act of 'depositing' into student 'depositories' by the teacher 'depositor' (Freire, 1970/1993), heightened my sensitivity to what I observed taking place in classrooms and around the school. My cynicism grew. I started noticing things like the size of the cloakroom, length of classes, number of gym periods per week, and so many other disadvantages. Sadly, they were quite easy to spot.

As I became more familiar with his work, I realized that Freire's words were directed at me when he stated: "For cultural invasion to succeed, it is essential that those invaded become convinced of their intrinsic inferiority. Since everything has its opposite, if those who are invaded consider themselves inferior, they must necessarily

recognize the superiority of the invaders" (1993, p. 153). It was I, representative of the dominant culture and *invader*, obliging one quarter of my class to suppress their native tongues and speak only English while inside the confines of my classroom. Clearly I was unconsciously enforcing a "pedagogy of the oppressed," at least until I met with Freire's ideas and was forced to confront these powerful accusations.

Unfortunately in each of these scenarios, students were described as *things* that were acted *upon*. Not surprisingly, as Doyle (1983) points out, students do recognize that they are part of an accountability system, and that their success hinges upon how the teacher assesses them. They know that performance is exchanged for grades, which Sharma and Anderson (2007) call a "tacit agreement between the teacher and the taught, [and] teachers secure students' compliance to classroom instruction by reducing ambiguity and risk (of failure) in academic work" (Section 3, para. 5). I confess that I too was guilty of holding this agreement over students' heads and I was not proud of it. But as the puzzle pieces started to fill in and I became aware of the hidden constraints of the system within which I was teaching, I was able to show myself a little compassion.

Another disconcerting yet supporting piece of information concerns the construction of schools. Both a fellow grad student and Abramson (2007) informed me that a school's size is calculated by multiplying an allotted *space per pupil* by the number of students attending the future establishment. I found this notion particularly troubling, especially when coupled with the earlier ideas about social control. My mind immediately conjured up images of students restricted in movement by invisible enclosures in the same way that they might experience being chained to a desk. Later I would learn Foucault extended these ideas in a vision he called the *Panopticon*, a prison design that he compared to the architecture of schools:

> it can reduce the number of those who exercise it [power], while increasing the number of those on whom it is exercised. […] its strength is that it never intervenes, it is exercised spontaneously and without noise, it constitutes a mechanism whose effects follow from one another.

> Because, without any physical instrument other than architecture and geometry, it acts directly on individuals; it gives 'power of mind over mind.' (Foucault, 1979, p. 206)

To me, this metaphor signifies the blatancy of the power structure hidden in plain sight: the configuration of the classroom. How else might we disempower students than to sit them in isolation, viewed from 360 degrees, and restrict them from movement and the protection of others? Unknowingly, according to Foucault, I as their teacher was exercising my *power of mind over mind* in the mere arrangement of the desks.

While these ideas might not stir up any significant reactions or emotions in others, for me they set the spin in motion. I no longer seemed able to believe that covering the provincially-mandated curriculum with my students had any significant meaning. I felt as though I had been complacently participating in a system in which grades were the currency in the purchase of a student's compliance. Each day 30 faces would meet mine and I could no longer convince myself that what I was doing made sense. It was as if I woke up to an Orwellian, *1984* (Orwell, 2013) reality and realized I was carrying out someone else's agenda. I was bound for Room 101 and I couldn't see any way around it.

Another way to look at this would be to think back to how you might have felt when you discovered there was no Santa Claus (or Tooth Fairy, or whatever secrets your parents kept from you that you discovered later). How did you make peace with the fact that what you thought was real turned out to be an illusion? In my case, what I *thought* was real – my role as a teacher within the school system – and what I later perceived to be the *illusion* – the hidden nature of that system – led me to discover that there was much about this system that I did not understand. So in that sense, I felt as though I attained a whole new level of awareness. Or at least, it brought me to a whole new level of questioning. Ironically, I was now a student within my own greater *cognitive dissonance-disequilibrium* lesson.

Once I started to question my role in the school system, I was now forced to ask myself whether I could continue in my role as a teacher. Around the same time, my personal life would decide to turn up the heat as well: I lost my beloved dog, Einstein, and had a close family member experience a major life crisis. The heaviness of these events compelled me to consider the *bigger picture* – life beyond the walls of my classroom – and to expand the focus of my research to one that would brim with enquiry and meaning on a much larger scale. Ultimately, I decided to abandon the study of controversy in order to pursue the journey that is documented here – a journey in which I set out to answer one fundamental question, *How did I end up here?* Now that these major shifts in my life were taking place, I was intent on conducting research that held deep personal meaning and inspired insight. Redirecting my enquiry to one of self-discovery offered such promise.

Righting the Ship

From what I've described so far, you may now have a sense of why learning about the school system was traumatic for me. On one hand, it may have been due to the fact that it caused me to wonder: What was it about me that I must continually trip over things before I discover their hidden nature? Am I that naïve? On the other hand, it might have been caused by the belief that these realizations demanded some sort of action on my part. And it would need to be a decisive action since it was clear that I could not, in good conscience, continue to float in the *fog of uncertainty* indefinitely. What harm was I inflicting on my students? Or on myself, for that matter? I was slipping further and further from adhering to the prescribed learning outcomes of course curricula, turning instead to increased playtime outdoors and activities that promoted self-esteem and positivity.

Fortunately, one of my parents' gifts to me was a strong sense of self. So, while I was immersed in the confusion and uncertainty surrounding my predicament, I also felt

sure I possessed the internal resources required to gain some clarity. In the past during moments like these, I have always found that a little left-brained reasoning and analytic thinking goes a long way. Therefore, it made perfect sense to apply it now and regain some forward momentum.

From my perspective, what appeared most logical was to assess my situation as one of *being lost*, in which case, the next step was self-evident. If I knew where I started and I had some inkling as to where I was now (a doctoral student and educator), I should be able to apply the metaphor of a map. To me, a map is most useful when charting unknown territory (something I learned as a navigation officer in the Canadian Armed Forces many years ago). It provides a bigger picture and ideally contains the point of origin and the final destination. If so, the task then becomes one of traveling between these two points by making a series of turns. In which case, all I had to do now was review and analyze the turns of my metaphorical map. I decided to refer to them as "critical events" for two reasons: to signify their importance, and to underscore the fact that *criteria* (which I describe later) separated them from the daily, indiscriminate happenings of my life.

Looking back to Piaget's notion of disequilibrium, I realize that taking such steps allowed me to return to a state of balance. One might even infer that my situation qualified as one of Mezirow's (1990) disorienting dilemmas and produced transformative learning. Regardless of its positive potential, when I looked over the outline of my *second* project proposal which focussed principally on my life experiences, it had the faint scent of narcissism and could be described as an 'armchair' piece. This notion did not sit well with me, since I was already tentative about venturing off the path of a traditional, quantifiable, scientific format for my study. But how should I proceed?

As it turned out, the solution resided in the selection of my research methodology (see Chapter 3), which I determined would take the form of an *autoethnography:*

auto (self) + *ethno* (culture) + *graphy* (process of writing or recording)

Although I was still going to provide a personally-documented account of my experiences (see Chapter 4), I also invited the participation of others to help me make sense of my journey by offering input and insight while holding up *mirrors* which would force me to challenge my own thinking. In the end, I extended an invitation to each participant to share her or his own critical event with me in the hopes that I might be able to further my thinking about its significance as well as determine if individuals' critical events might share common traits. This method also allowed me to find out to what extent my experiences resonated with others (see Chapter 5).

Finding Meaning Along the Way

As I took the steps I deemed befitting a doctoral-level study, which at this time included analysis and more specifically, *coding*, I began remarking how dry, routine, and lacking in stimulation my procedures were. I found it especially difficult to distill the wonderful details my critical friends shared with me into bytes of information that could be linked, cross-referenced, or reduced into something meaningful for my study. This brought about the realization that perhaps a left-brained approach might not be the best option, which caught me quite off-guard. Nonetheless, attempting to interpret and convey the intimate descriptions of others' critical events was a necessary and important part of my process, since it brought to my awareness the uneasiness and discomfort that these tasks presented.

Consequently, my passion for the project began to wane significantly. When I imagined how the study would progress if I stayed on this path of grounding my critical events in the accounts of others, it felt like I would spend too much time looking backward to the past, and that I wouldn't advance myself as a person. So I decided I couldn't restrict myself from the potential that still lay ahead of me. I knew I needed to

abandon this autoethnographic aspect of my research to explore alternative methodologies and epistemologies that would better fit the type of enquiry this study might become.

At this point, I became very conscious of the fact that such an alteration of course was not only required, it might very well be the last chance to resuscitate my then expiring interest in the research. After all, *finding* m*eaning* was and continues to be the central goal of my doctoral studies. Thankfully, having given myself permission to take an enquiry approach to these unforeseen twists and turns, I redirected my focus to one I would find personally invigorating. The question was: What aspects of the project have the potential to re-ignite my excitement?

As I pondered the possibilities, I could feel my interest rise as I contemplated a few rather unorthodox ways of pushing the boundaries of both science and my study. Looking back on the knowledge I had acquired thus far, I followed this line of logic: If critical events are the turning points along a journey from satisfaction to disillusionment, then to what can I attribute such a change in emotional state? In other words, what is it about these critical events that point me in new directions, but also change who I feel I am as a person? Were the events somehow acting on me? And if so, what was the mechanism?

Next I asked myself: What did I possess after the critical event that I didn't possess before? Instantly, the key idea presented itself: *Expanded awareness!* It took several days to fully appreciate the implications of this. I realized that if I could somehow determine the potential of critical events to expand awareness, it might lead to important insights about learning, growth, and perhaps even personal transformation. My passion was re-ignited and immediately the possibilities for my research appeared endless. I could look at the concept of awareness from different perspectives: Eastern, Western, Indigenous, spiritual, paranormal, and so on. But perhaps the most exhilarating

aspect of this new direction was the idea of spending time with scientific thought to see how far it had come on such topics as consciousness and awareness (see Chapter 6).

Once I liberated myself from the obligation to stay on the path of convention, my study found new momentum. Everywhere I turned there was a person, a book, or nature offering me inspiration. As an example, this quote by Christian de Quincey, playfully capturing the irony of consciousness research, immediately surfaced once I changed direction: "Scientists find themselves in the strange position of being confronted daily by the indisputable fact of their own consciousness, yet with no means to account for it" (cited in Russell, 2004, p. 26). Amazingly, similar thoughts and ideas started flowing toward me and I simply had to collect and assemble them.

Quickly and easily I conducted my research, discovering surprises along the way, and ultimately satisfying a personal desire to reunite science and spirit. Finally in Chapter 7, I stepped away from the project to offer some observations about how I was changed by it. I also gave myself permission to allow insights to flow freely onto the pages and honour the emergent nature of the writing, as opposed to organizing the content with certain predetermined plans. In the end, it became my final farewell to teaching and I felt quite pleased about the sense of closure it gave me.

In the next chapter, I review the literature that speaks to my enquiry; the knowledge that I gleaned from those influential scholars who pointed me toward an expanding sense of awareness about myself, Catholicism, the teaching profession, and many other things. Of particular note, however, is the fact that I have organized this information in an unconventional manner. That is, I present the authors and their teachings *first*, then offer the personal and historical contexts as well as the impacts this learning had on me *second*. I call this unconventional because without such advance notice, it may appear that the literature review is more descriptive than analytical, and meanders in many different directions. As a reader, it would be important to know that I present an historical account of science, the study of consciousness, and topics that

verge on being spiritual in nature from several perspectives in an attempt to contextualize the literature as it relates to my journey. In other words, I am very much present in the review.

Before I proceed, however, I feel it is important that I remind you of my biases, or what some call my *worldview* – the lenses through which I see the world. First, I may be described as a white, small-town, middle-class, middle-aged, former-Catholic, Canadian female. Although these descriptors only scratch the surface, since they can be considered broad generalizations with multiple interpretations, I shall let them serve as an acknowledgement to the reader that I am aware they act as *filters*, thereby colouring my perspective. Accordingly, I shall add that I am a student of western, Euro-centric science, which taught me that in order for something to be considered scientific, it must be objective, testable, measurable, and reproducible – doctrines I followed faithfully until they were called into question during a Masters course in 1997 (described in a journal entry entitled, '*Mindwalk' by Bernt Capra,* found in Appendix B) and again now in this thesis. Keeping these details in mind will not only provide a more complete picture of the person behind these words, but will also give insight into my actions and reactions described in this dissertation.

Chapter 2.

The Giants on Whose Shoulders I Stand

"The secret to creativity is knowing how to hide your sources."
~ Albert Einstein (n.d.)

Reviewing the Literature

When thinking back on the words of a friend who successfully defended her thesis, I was attracted to one strategy she used that helped clarify the creation of her theoretical framework. It was to pose the question, *Who are you thinking with?* In other words, whose arguments and theories are you using to frame your research? In this chapter, I follow this approach and share the work of individuals who have been instrumental in shaping my journey. Unfortunately, this is not an exhaustive inventory of all the people who influenced me, since their inclusion would at least double the length of this dissertation and perhaps overwhelm the reader unnecessarily. Therefore, after several drafts and some strict selection criteria, I reduced the list to the following body of key figures. But before I begin, I wish to express my gratitude to all those who have led me to the ideas and insight shared here.

A second, vital piece of information required when reading this chapter is to understand its structure. Contrary to some traditional reviews of literature which abound with multiple variations of "According to Miller (1999) ..." and read more like lists or annotated bibliographies (Biklen & Casella, 2007), I have placed the voices of academe *in situ*. That is, they are organized based on where they fit along *my* journey. I

do this for one significant reason. It is my belief that by maintaining an autobiographical backbone, the rationale behind my selection of research becomes clearer and its significance and connection to my experiences revealed. Ideally, the reader will follow the same progression that I did, either actively learning alongside me as I share my account, or passively witnessing my growth and development as I create my metaphorical map.

A third element you will notice is that I maintain a prevalent theme throughout: How my relationship with science is influenced by what I discover. Often this relates to my role in the school system, either as student, science teacher, or teacher educator. At other times, my relationship encroaches on my own spiritual beliefs, blurring the boundaries between science and spirit, and ultimately leading to the question of *consciousness*. Each of my experiences carries some emotion with it, whether it be surprise, delight, intrigue, dismay, confusion, or a combination. Whatever the case, the love I have for what *I believe* science to be – a curious, unbiased, yet ethical pursuit of life's mysteries – has been challenged, reinforced, and enriched during this process.

Finally, much of the research I share below is also referenced in subsequent chapters. Several authors resurface as they help to explain phenomena that arise in Chapters 4 and 5, while others assist as I analyze my experiences in Chapter 6. They are the voices who give credence to my developing knowledge and on whose authority I draw as I construct new understandings.

Propagating the Mechanistic Worldview

To begin, I turn back the clock to the "Year 2000," the year when I was first initiated into the world of university instruction. At the time, I had been teaching in the K-12 system for a decade and started to yearn for something greater. I had been unable to find a way to dispel the restless nights, fluorescent fallout (the mental and physical

drain that comes from the lights in my classrooms), weekends filled with mountains of marking, and holiday illnesses. For this reason, I decided to take matters into my own hands so began seeking inspiration elsewhere, which led me to working in a university classroom as a Faculty Associate and instructor.

During my first semester of teaching at the university, I found myself before a group of high-school science candidate-teachers, who arrived with their newly-minted degrees and visions of sharing their passion with future students. Both academically and socially, they were the *best of the best*, having demonstrated top performances in earlier coursework, a keen interest to work with young people, and already possessing an impressive list of contributions to society. A teacher's dream. And aside from the difference in age, they entered the room with the same excitement as did my elementary students on the first day of school. I felt that I was definitely in the right place!

Fast forward three weeks. The lustre of the job had worn off and I was beginning to seriously question our science education system. I discovered that these students possessed antiquated views of teaching and seemed quite reluctant to stray too far from teacher-centred lessons and lecture-style delivery. They were not buying into my collaborative, enquiry-based, self-directed curriculum. It was as if the clock had stopped and nothing in science education had changed since I got my bachelors degree in the '80s. Unfortunately, preliminary investigations were proving this might be the case.

Evidently, this fact is not lost on Carl Wieman, renowned physicist and science education advocate, who sums up the disappointing reality of how student attitudes are currently being shaped by traditional approaches to education in physics:

> Put in the starkest terms—our physics courses are actually teaching many students that physics knowledge is just the claim of an arbitrary authority, that physics does not apply to anything outside the classroom, and that physics problem solving is just about memorizing answers to irrelevant problems. Even more disturbing, we find that those students who are

> planning to become elementary school teachers have the most extreme of these novice-like beliefs. (Wieman, 2007a, p. 8)

Although such dramatic research findings prompt Wieman to actively promote the rethinking of undergraduate science programs in an effort to combat the propagation of such mind-sets (Wieman, 2007b), the fact that so little has changed in my students suggests to me that this transformation may take time.

According to Theo Wubbels (1992), the persistence of candidate-teachers' unchanging traditional views can be explained in terms of "world images," similar in meaning to worldviews. Especially vulnerable are candidate-teachers of secondary science who come straight from a degree program into teacher training. They tend not to have experience working as scientists in the field and so possess epistemologies that are often based on their own experiences as science students (Wubbels, 1992). Nam-Hwa Kang (2007) notes that those possessing traditional conceptions of education are most likely to apply conventional strategies, such as transmitting factual knowledge, to effectively fulfill what they perceive their role to be. Such world images were very prevalent among the students arriving to my courses each year.

I too could have been accused of holding the traditional mechanistic view of science during my first ten years of teaching. Or as Fritjof Capra (1982) so eloquently puts it, I possessed a "crisis of perception," since I was teaching "concepts of an outdated world view – the mechanistic world view of Cartesian-Newtonian science – to a reality that can no longer be understood in terms of these concepts" (pp. 15-16). What I find especially fascinating is that he wrote this in 1982 *before* I started my science degree, which prompts me to question: What leads to this deeply entrenched, cyclical propagation of scientific dogma that I and others unconsciously disseminate? Unbeknownst to me, a four-hundred year-old, European history would not only divulge the answer but reveal an unexpected and personally-sensitive twist – the involvement of the Catholic Church. (To appreciate why I was sensitive to the Church's involvement,

please read Appendix A and the first 2 entries of Appendix B, entitled, *Jonah and the Whale* and *Learning About Evolution.*)

In an effort to understand the history, I needed to step back to a period known as the *Enlightenment*. It was a time when one's western beliefs about the laws of the universe had been governed by Christian dogma, but now science and its new discoveries were beginning to be able to explain the wonders of the natural world. The first and perhaps most profound of these findings that challenged fundamental religious beliefs of the time was Nicolaus Copernicus' hypothesis that the planets of the solar system revolved around the Sun and not the Earth (DeWitt, 2010). This meant that, contrary to Catholic doctrine, the Earth was not at the centre of the universe. Consequently, such a heretical idea not only caused humans to question their own existence but also threatened the Church's authority: "This way of seeing the world (literally) was profoundly engaging and affected how people viewed the Church, God's plan, and man's place in the grand order of the universe" (Wong & Pugh, 2001, p. 326). Not surprisingly, the magnitude of this conjecture's impact shook both the scientific and religious communities of the time.

Frightened for his personal safety, Copernicus was reluctant to share his discovery:

> For fear of being burned at the stake, Copernicus did not publish his findings until 1473 – the year of his death. True to his fears, both the Catholic and Protestant Churches condemned his findings as heresy. [...] Copernicus was declared a heretic and his books were burned.
> (Pahl, 2011, p. 174)

At a time when people were being persecuted for their anti-religious assertions, Copernicus surely realized that even scientific evidence would not stand up in religious courts. His decision to remain silent likely saved his life.

Recognizing the threat that this emerging science presented, the Church boldly asserted its power. Unfortunately for Giordano Bruno, who agreed with Copernicus' theory and was accused of other supposed scientific heresies, this meant going on trial before the Spanish Inquisition. He was found guilty and burned at the stake in 1600, not long before Galileo Galilei faced similar charges (Gingerich, 1981; Russell, 2008). Despite the fact that Galileo's findings also revealed a heliocentric model of the solar system and that the scientific community was seemingly gaining momentum, the Church's rule prevailed: "A number of penalties accompanied this verdict. First, Galileo had to recite immediately an 'abjuration' of the 'above mentioned errors and heresies.'[3] Second, the Dialogue was banned. Third, he was condemned to house arrest to the end of his life (1642)" (Finocchiaro, 2008, pp. 260-261). Consequently, the shock of such harsh blows directed at science and its practitioners – from Copernicus' fear, to Bruno's burning at the stake, to Galileo's abduction and subsequent house arrest – was felt throughout Europe for many generations to follow (Gingerich, 1981). (Since I too had grown up influenced by the Catholic Church, learning about this history caused me to be filled with shock and dismay. So much so, I began to seriously rethink my involvement.)

Several decades later, having learned from the misfortunes of his scientific counterparts, René Descartes skillfully sidestepped the wrath of the Church by selecting areas of research that presented no conflict. "He divided the cosmos into two realms: the realm of things that could be physically measured – the world of time, space, and matter – and the realm of thought, the world of consciousness and spirit" (Russell, 2008, p. 2). He contented himself with studies of the former and left matters of the spirit to the Vatican. For this split, he gained both great respect for his numerous contributions to scientific thought, and great notoriety, since scientists of the 20th century would be more critical. (As an interesting aside, apparently Descartes' epitaph read, " 'Bene qui latuit, bene vixit,' from Ovid's Tristia 3.4.25 translation: 'He who hid well, lived well' " [Damasio, 1994, p. 249], which causes one to wonder if this is Descartes' final confession regarding the steps he secretively took to protect himself from possible demise.)

According to William Doll (1993), Descartes' actions were ultimately responsible for the externalization of knowledge, meaning that nature could be known objectively. As a result, there was a shift from a personal sensory connection with the world to the pursuit of rational explanations of Earth's forces, deemed to be free from bias and human interaction. "Knowledge existed 'outside' – immutable, unchangeable – residing within the great Laws of Nature" (p. 32). This objectification of knowledge meant that nothing lay beyond the reach of human reason and therefore all truths could be acquired (Descartes, 1968). Unfortunately, this view inadvertently positioned scientific rationality as the "supreme Wolf" (Doll, 1993, p. 33), also termed "super-science" (Rorty, 2009, p. 359), in the school system of the 20th century, which prompted Doll (1993) to retort, "It is a conceit which underlies our modernist concept of curriculum – we allow only one type of knowing: a rational, definitional knowing" (p. 33).

Initially, I criticized Descartes for having the audacity to compare nature to machines and accused him of setting us on a path where the well being of the planet was secondary to the pursuit of scientific knowledge. Surprisingly, however, I discovered information about Descartes that caused me to see him in a different light. For instance, when he wrote the infamous words, "Je pense, donc je suis" (Descartes & Gröber, 1637/1905, p. 23), or, "I think, therefore I am," I had understood this to mean that without thinking, we would not exist. I later discovered that a more accurate translation might be "I think, so *I am.*" I contemplated the idea that Descartes actually meant *being* was the pre-existing condition for thinking, since later in the same quote, he states, "je vois très clairement que pour penser il faut être" (p. 23), or, *I see very clearly that to think, it is necessary to be*.

This was an important clarification for me to make because it allowed me to see why and how teachings can be misinterpreted. It also highlighted what eventually became known as the "mind-body" problem (discussed later), which Descartes & Gröber (1637/1905) introduce here:

> je connus de là que j'étais une substance dont toute l'essence ou la nature n'est que de penser, et qui pour être n'a besoin d'aucun lieu ni ne dépend d'aucune chose matérielle. En sorte que ce moi, c'est-à-dire l'âme, par laquelle je suis ce que je suis, est entièrement distincte du corps.
> (pp. 22-23)

According to my translation, he is saying that what makes up one's whole essence or nature is *thinking*, which does not require any place nor depend on any physical thing. What makes him *him* is his *soul*, which is entirely distinct from his body [end of quote]. From this dualist perspective, he appears to be suggesting that thinking does not take place in the body, i.e., brain, but instead occurs by the grace of God. This notion is reminiscent of Saint Augustine's *illumination* (mentioned later), and ironically, it underscores a problem which continues to confound modern science even today – that we are still unable to agree on exactly *how* thinking happens.

From an historical perspective, Descartes' efforts laid the groundwork for future scientists of the Enlightenment. By shifting the focus to a materialist science away from the eyes of the Church, the path was paved for an open, unencumbered pursuit of scientific knowledge (Powell, 2007). Academic institutions soon followed suit (David, 2001) and it was not too long before science was claiming power that the Church once held. As its repertoire of explanations and research grew, science became indisputable and gained a reputation of infallibility (Russell, 1912). Naturally, "scientists found their intelligence and knowledge to be unchallenged and their opinions in great demand" (Toumey, 1991, p. 688). I wondered if it was here that the seeds of an objectivist view of science were first cultivated.

Now that the way was clear, several individuals broke new ground as they ventured into the mysteries of the unknown, material universe – the most famous of whom was Isaac Newton. Like Descartes, his name went down in history for a myriad of reasons; although, as he himself acknowledged, his accomplishments can be attributed in part to those who preceded him: "If I have seen farther, it is by standing on the

shoulders of giants" (Brewster, 1885). Since Newton's achievements form the foundation of the modern science era, I have included a brief summary of them and their consequences here to stand as a testament to the pillars of what later became known as the "Newtonian worldview":

- Newton built upon earlier mathematical postulates and arrived at his first law, the *law of gravity*, which he also demonstrated was applicable to planetary motion (Janiak, 2004, p. 12). This demystified movement of the heavenly bodies and inferred that nature was indeed governed by laws.
- From his first law, he devised 3 more irrefutable laws of motion (Janiak, 2004, p. 70), which described the behaviour of matter and laid the foundations for modern science, affirming that eventually, humans could discover all the secrets of the universe. These laws would remain undisputed for the next 300 years.
- He was able to propose a theory of colour when he discovered that white sunlight could be broken down (Shapiro, 1980). His work with prisms and lenses also allowed him to compose a detailed treatise, *Opticks*, on the reflective and refractive properties of light, which in turn led to the invention of a reflecting telescope. He also believed that in time and with a strong enough telescope, scientists would discover that light was made up of tiny *corpuscles*; a theory which quantum mechanics eventually disproved (Newton, 2007).
- His contributions also extended to mathematics (binomial theorem) and the creation of calculus (Whiteside, 1961).
- Because of his reputation, several of Newton's incorrect claims were accepted over more accurate scientific findings by 'unknowns,' which were dismissed as a result.

Looking back on my own science education, I wonder what impact the knowledge of the Enlightenment, the role the Catholic Church, and the complex history whose surface I barely scratched above, would have had on me and my teaching had I been exposed to the tumultuous birthing of modern science. I also question how many university science professors know about this history. Do they see this knowledge playing a part in their pedagogy? One thing was for sure, science still appeared to be conveyed as fixed, empiricist, and something to be memorized, *not experienced*, in the

eyes of the students who arrived in my classroom as recently as 2010 (the year I left teaching).

Off Limits!

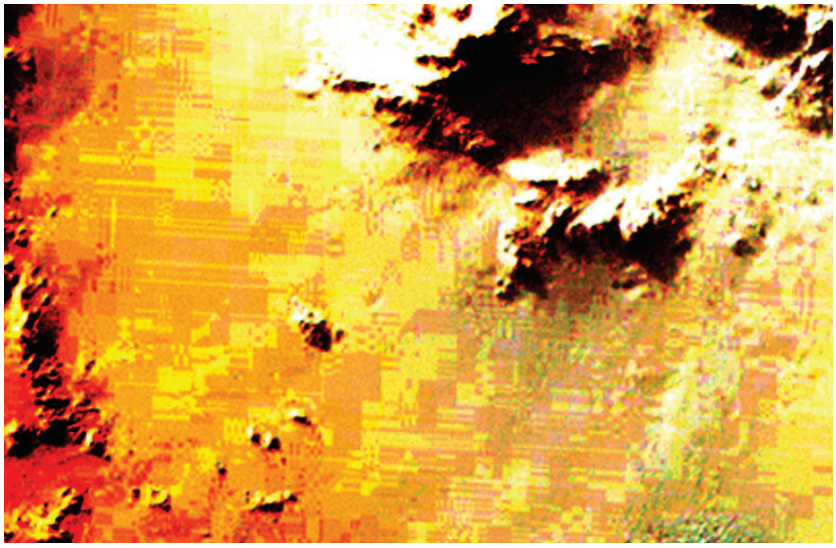
During my early days of teaching at the university, I recall how surprised I was that students were still graduating with such antiquated notions about science. While I recognized that Newton's laws and other traditional concepts accurately explained many aspects regarding the nature of the universe, it was intriguing and frustrating to me that large proportions of people continued to believe that scientific knowledge is irrefutable and that scientific research represents the opinions and findings of the entire scientific community (Silverman, 1992). Since candidate-teachers possessed such entrenched ideas about science, I had no idea if they would ever be open to what I was saying. I figured their scepticism would colour the messages I was conveying and I feared they would repeat the cycle of ignorance the way I initially had. Most of all, I worried that their potential future students would miss out on the magic and joy of science.

To my surprise, I found that posing such questions as, *Do you know for a fact that there is no life on Mars?* or, *Were you aware that I am a member of the* Flat Earth Society*?* could serve as a powerful means to rouse my science candidate-teachers out of their objectivist, reductionist slumbers. By employing techniques that promoted cognitive dissonance and disequilibrium, I forced students to question their existing knowledge. Thankfully, since their admission into the Education Program had been based on demonstration of meta-cognitive abilities in which they could think about their own thinking, it was not long before I witnessed a considerable change in students' attitudes and behaviours regarding science. I could sense their 'Ah ha!' moments as they understood that not only was science far more magical than they had been taught, but it could also be far more elusive too. Having been unable to convince me that the Earth

was a sphere, they began to appreciate that they themselves had taken a lot of information for granted in their unquestioning acceptance of what they had been taught.

Ironically, when I started using controversy as a teaching tool because of its potential to create states of dissonance, little did I know that I too would fall under its spell. For example, when I presented a Youtube video containing a curious image of Mars (see Figure 1), I was compelled to ask myself the same question I had asked my students: Do I know unequivocally that there is no life on Mars? As instructed by the video, I downloaded the high-resolution photo of Crater Hale located on the European Space Agency ("European Space Agency," 2004) website, opened it in Photoshop (digital image software), then adjusted the lighting levels. When I examined the resulting non-random shapes of Figure 1, I could not help but think that they were unnatural. So when I presented the challenge to my students – to convince me that the geometric figures clearly seen were *not* made by sentient beings – it was a legitimate query for me as well.

Figure 2.1. High Resolution Image of Crater Hale on Mars



From that time forward, I placed no boundaries on my newly-conceived *Science Fact or Science Fiction* activities. Everything I came across relating to how we see the world became fodder for the course. The abundance of potential material was multiplying daily on the Internet and there was no shortage of controversial topics. Soon, it became clear that the aspects of science generating the most interest among my students could be classified into two categories: *pseudoscience* and *suppressed science*. But before I present examples of each, I need to provide a bit of history relating why some science has been accepted while other science has not.

Early developments of the scientific method in the West have been traced as far back as Greek Antiquity, but the inductive method (still prevalent today) has been credited to Galileo in the seventeenth century and embraced by his successors. It was founded on the principle that there is an order to nature, thus permitting the application of reason, empirical description, and measurement to her (Caldin, 1952). Once the scientific community began following this protocol, previous tendencies to "read human characteristics into nature and think of nature on the analogy of man" (p. 350) were replaced with objective experiments that denied the presence of human participation in the experiments. I began to suspect that it was this deviation away from humanist analogies that caused my students to believe that scientists were not present in the science, (a concept I too believed until I stepped into my role as devil's advocate during my *Science Fact or Science Fiction* activities over a decade ago).

One of the more contemporary measures to determine the testability of theories was developed by Karl Popper (2013), who proclaimed that findings can only be considered scientific if they are "falsifiable," meaning there is potential to demonstrate, either through experiment or empirical means, that the theory can have a false outcome. For example, if one theorizes that all swans are white, the appearance of one black swan would *falsify* the statement, consequently deeming the theory *scientific*. (Seems counter-intuitive to me.) Similarly, any theory that is not falsifiable, even though

it may be considered true using the scientific method, falls into the realm of the *pseudosciences* (Popper, 2013). We shall borrow this definition of falsifiability for our first category of 'off-limits' science.

In an effort to investigate topics considered to be pseudoscience with my students, I came across the most shocking, yet exciting, of all my discoveries. It involves Cleve Backster, a CIA expert in polygraph testing who decided to attach his instrument's electrodes to plant leaves. Much to his surprise, the machine produced an ink tracing similar to that of a human's emotional response (Backster, 1968). This inspired him to consider conducting tests that would arouse the plant and perhaps stimulate some more extreme reactions. Standing fifteen feet from the plant in question, as it occurred to him to burn its leaf, he remarked:

> The very moment the imagery of burning that leaf entered my mind, the polygraph recording pen moved rapidly to the top of the chart! No words were spoken, no touching the plant, no lighting of matches, just my clear intention to burn the leaf. The plant recording showed dramatic excitation. [...] my whole consciousness changed. I then thought, "Gee, it's as though this plant read my mind!" (Backster, 2003, p. 24-25)

Of course, when I read this, my first response was, *How cool is that!* Definitely something for my *Science Fact or Science Fiction* activities. The next step was to determine if Backster's findings were indeed considered good science and worthy of sharing with my class. During my investigation, I came across an article by Horowitz, Lewis and Gasteiger (1975) who attempted to replicate the original experiment but reported they could find no evidence of plant perception whatsoever. In effect, their results confirmed what the cynics already felt they knew, that it was ridiculous to think that humans could communicate with plants.

And so, that was where things stood until I discovered a book entitled, *Psychic Exploration: A Challenge for Science* (Mitchell & White, 1974). In Chapter 12, Marcel Vogel (1974) recounts not only how he was able to reproduce Backster's experiment, but other

incidents of human-plant communications: for example, Sir Jagadis Chandra Bose showed that plants do have a nervous system in the early 1900s; John C. Pierrakos claimed to see energy fields around plants; Reverend Franklin Loehr studied the power of prayer on plants in 1959; and Ward Lamb experimented on long distance communication with plants in 1973, to name only a few. Vogel's own contribution to these studies includes confirmation that by using biological sensors, signals can be detected which indicate plants respond to human thoughts and emotions (Vogel, 1974). Learning that other scientists had conducted research into plant communication and sentience not only rekindled the debate about Backster's original findings but also allowed me to confidently present it as a multi-faceted controversy to my students.

Finding this book led me to another remarkable discovery. It turns out that Edgar Mitchell founded the Institute for Noetic Sciences (IONS) the year after he returned from his Apollo mission in 1973 (Mitchell & White, 1974). According to the institute's definition of *noetic sciences* – "A multidisciplinary field that brings objective scientific tools and techniques together with subjective inner knowing to study the full range of human experiences" ("What are the Noetic Sciences?," n.d.), it appears as though Mitchell and his group have been attempting to create a new kind of science, and it challenged most of what I had learned in school. In addition, the organization claims to have been conducting valid, scientific experiments on psychic abilities, UFOs, and out-of-body experiences since the '70s. Clearly, not everyone feels these topics are off limits. As for my journey, it was the first inkling I got that there existed scientists who acknowledge the role of subjective knowing in science. Pursuing these seemingly controversial topics was definitely a direction I decided to explore with my candidate-teachers of science.

On a personal level, the more I learned about these pseudosciences, the more intrigued I became with the world and the things I was discovering. Naturally, I wanted to share this in my science courses. To signify the newness and surprising nature of

these concepts as compared to those of my traditional education, I shall conclude with an example in which three professors in the medical field set out to ascertain if a heart's *cellular memory* could be transferred to a heart-transplant recipient from its donor (Pearsall, Schwartz & Russek, 2002). They did so by examining personality changes in the recipients to see if a link could be found between new behaviours exhibited by the recipients and former behaviours of the donors with whom no contact was made other than the transplant. The investigators found that there were notable changes in many of the patients, which included "changes in food, music, art, sexual, recreational, and career preferences, as well as specific instances of perceptions of names and sensory experiences related to the donors" (Pearsall, Schwartz & Russek, 2002, p. 191). In one case, a confirmed lesbian turned 'straight' claimed after surgery: "I think I got a gender transplant" (p. 198). It was hard not to be swayed by the evidence.

This unfalsifiable example of pseudoscience brings up two questions that generate great discussion and debate among candidate-teachers regarding the study's potential scientific merit. In the first case, since there are no ways to trace cellular memory from donor to recipient using existing technologies and the data collected is anecdotal in nature, the researchers must rely on the subjective experiences relayed to them by the study participants. Therefore, one important question to ask students to consider is whether or not science should accept first-person accounts as valid evidence as well as the potential arguments for and against. As for the second question, is it possible that at some point in the future this experiment might be reclassified from pseudoscience to *frontier* science, since it is conceivable that traceable markers might one day be found that produce more definitive results? I quickly learned that by indulging in these types of enquiries, I was able to provide students with powerful means to examine the nature of science while giving them opportunities to reflect metacognitively about their own learning as they considered what counts as good science.

Regarding the second category of 'off-limits' science, which I call *suppressed science*, it can be distinguished from pseudoscience in that the data collected and the experimentation carried out are thought to be authentic and valid by the scientific community. However, the research and its findings have, for one reason or another, been buried or silenced. In perhaps the most disappointing of my discoveries regarding suppressed science, I found out about a man named Nikola Tesla, possibly the greatest inventor who ever lived. Despite his achievements, most people (scientists included) have never heard of Tesla (Vujic, 2001, p. 9). That may be due to a number of reasons, which I shall briefly mention here to illustrate what I and most of the candidate-teachers in my courses learned was being kept from us.

First, although Tesla's patent for the alternating current (AC) electric power surpassed Thomas Edison's inferior direct current (DC) system in terms of both cost and efficiency, Tesla's employer dismissed his ideas until much later in life (Cheney, 1981, p. 19). Second, when financier J.P. Morgan learned that Tesla was using part of Morgan's funding to develop wireless energy transmissions, he ceased all further support (Marinčić, 1993). He had been responsible for the merger that created General Electric, and so was not interested in any 'free' sources of energy that could not be metered and billed. Fortunately, thanks to Margaret Cheney's efforts to piece together Tesla's life from manuscripts, newspaper articles, and more recent studies of his scientific research (Carlson, 1983), we can find a fuller description in her book, *Tesla: Man Out of Time* (Cheney, 2011). In it, she documents Tesla's remarkable achievements, which were undoubtedly significant events in scientific history. This forces us to ask, or at very least to wonder, why these events were suppressed and who would have had the power to suppress them.

Another example of *suppressed science*, and you may wonder why I didn't include it with the pseudosciences, involves assertions made by nuclear physicist, Stanton T. Friedman, that UFOs and ETs are real. Although the scientific community does not

generally accept such claims, when presenting Friedman to my university students, I took the position of a *believer* and challenged students to prove that his and others' reports were not in fact *suppressed science*. According to him, a division of the United States government was able to carry out a masterful cover-up of a crash by alien spacecraft (Friedman, 2008) so very few eyewitnesses could corroborate his allegations. Consequently, investigation of the existence of life on other planets and space travel has become off limits to any scientist who does not want to be ridiculed or considered 'crazy.'

If what Friedman says is true, providing candidate-teachers with the opportunity to consider his claims opens them to the possibility that science extends well beyond the traditional limits we have been taught to believe. Not to mention, it indicates that there must be other forces at work which direct how science proceeds, not only within but outside the scientific community. Contrastingly, if his allegations are not true, then this exercise has allowed students to practice and develop their investigative skills. In either case, this example has led us to ponder and examine the following question: Are there or should there be basic, rigorous steps that scientists can take which validate their work, regardless of how 'unscientific' their topics might be perceived?

Incidentally, I learned several years later that although the western world has been reluctant to acknowledge the possibility of life on other planets and the existence of extra-terrestrial beings, many cultures have not. For example, I have seen instances of artwork around the world, like the Egyptian helicopter hieroglyph (Fanthorpe & Fanthorpe, 2006), that suggest the possibility that Earth has been visited by ETs. This was personally significant since it underscored the role that cultural filters play in the way we see the world, and further highlighted the fact that science has actively pursued some topics while apparently suppressing others.

Among those groups possessing beliefs about life on other planets is a First Nations band to which my friend belongs. When he shared this, it certainly created

cognitive dissonance for me. Since this appears to be the next in the long line of learning opportunities, or *lessons*, that I share in this chapter, I will admit that when it came to most aspects of Aboriginal culture, I was a very ignorant, young adult, which I describe in the next section.

Indigenous Epistemologies and Ecological Worldviews

When my adventures working with candidate-teachers began as I joined the Faculty of Education, I received some lessons of my own. For example, as I was welcomed into the community during our initial gathering, I can distinctly recall feeling a certain amount of discomfort from one of the greeter's statements. She asked us to acknowledge on whose land we were standing by expressing our gratitude to the Squamish Nation. She pointed out that while the university bore the name, Simon Fraser, it would not have been without the assistance of the Indigenous people who had been living on the land for generations that he could become a famous explorer and fur trader that he did, let alone survive the Canadian wilderness. I was shocked; not so much by what she said, but by how ignorant I was to this fact.

At that time, likely due to my limited worldview, I had an odd (and naïve) collection of unchallenged misunderstandings about First Nation peoples and their cultures that I acquired when I was growing up:

- I thought 'Indians' lived in tepees in the mid-west of the United States. As a result, I had no inkling on whose land I had been living.
- I watched cowboy-and-Indian movies with no sense about their degree of fact or fiction. In many of them, scalping was to be expected and the cowboys were considered to be the 'good guys.'
- Because the films were in black and white, I thought 'Indians' lived a long time ago but then disappeared. Other than the Riel Rebellion, I don't recall ever being taught about them in school.

- I didn't know my best friend was Métis until two years ago.

Thankfully, much has happened between then and now; my knowledge and understanding regarding many First Nation cultures have grown significantly. Nonetheless, the journey has not been without its trials.

On completion of my teaching certification, one of my first substitute-teaching assignments was in an Aboriginal classroom. Fresh out of university, my ignorance of cultural knowledge was immediately brought to light. For two weeks, I shared a classroom with students who showed me how poorly they were fairing in the western school system. More importantly, they had little interest in listening to *anything* I had to share with them. It was the longest two weeks of my life.

Unfortunately, this type of situation is common. For many western educators, the Indigenous ways of knowing are completely foreign. Not surprisingly, Eber Hampton (1995) finds the make-up of "hostile" North American schools equally as strange because they involve: "Age segregated classrooms; Natives as janitors and teacher aides; role authority rather than kin and personal authority; learning by telling and questioning instead of observation and example, clock time instead of personal, social, and natural time" (p. 37). Such dissimilar perspectives explain the difficulty of inter-cultural communication that I experienced then. In order to overcome these differences in practices and beliefs, Hampton suggests that both groups must also contend with the shared history of the conqueror and the conquered, a concept I learned about when alerted to the story of Simon Fraser.

When I moved to British Columbia and began teaching science at the high-school level, there were several First Nation students in my classes. Hence, another of my lessons was finding out that Aboriginal students in schools across Canada were learning about science from the culturally dominant, western perspective. Without realizing it, I was projecting a notion that the world worked according to an abstract, firmly

established set of Eurocentric, scientific rules. This fact along with my lack of exposure to and understanding about alternative epistemologies contributed to an unconscious propagation of "cognitive imperialism" or "neo-colonialism" (Aikenhead, 2006, p. 2). Regrettably, many teachers convey the impression that there is only one way to know the *truth* about nature and the world around us.

Minority students who arrived to my classroom with differing conceptions of science undoubtedly felt isolated (Aikenhead, 2001; Aikenhead, 2006) and likely questioned my teaching. Since Indigenous epistemologies, or *ways of knowing*, particularly with respect to the natural world, are intertwined with spiritual beliefs that lose meaning when taught separately (Cajete, 2000), my methods must have created cognitive dissonance for them. Not surprisingly, there continues to be under-representation of Aboriginal students in science: "the foreign nature of school science and mathematics for many (but not all) aboriginal students [is] due to the culture clash they experience when they move from their home culture to the culture of school science and mathematics" (Aikenhead, 2006, p. 387). How many, I wondered, had I let slip through the cracks?

Clearly, there was much I could learn from my Aboriginal students. If they held the view that science is not separate from nature, then examining a holistic perspective should shed some light on why issues like global warming and disappearing rainforests might be lessened if we adhered to an Indigenous worldview. I suspect Glen Aikenhead would agree, since he claims that adopting an Indigenous epistemology would benefit *both* Native and non-Native students. Thinking back to a statement Francis Bacon made: "For you have but to follow and as it were hound nature in her wanderings, and you will be able when you like to lead and drive her afterward to the same place again" (cited in Merchant, 2003, p. 40), I wonder to what extent this type of western thinking about domination over nature is responsible for putting us on our current path of ecological destruction.

Fortunately, this led me to the work of Gregory Cajete (2000), who profoundly impacted my thinking about Native science. Through my reading of his work, I set on a journey of appreciation for a world that was still quite foreign to me. His ideas significantly expanded my knowledge of Native American culture, including: the Creator, Mother Earth, our brother and sister animals, the four elements, the cycle of life, and other examples. He also gave me valuable insight into the responses of Aboriginal students to such issues as animal dissection, cell biology, and physics.

Perhaps Cajete's most important gift to me was a model in which spirituality and science are mutually *inclusive*. He encouraged me to imagine what it is like to integrate spirituality into every aspect of one's existence, including teaching. This prompted me to wonder what science education might look like from an Indigenous perspective. I suspect that words like respect, vision, and sensitivity would be widely used. From this view, I doubt we would need to talk about 'saving the planet' because I don't believe that spiritual integrity would allow us to become so disconnected from Nature. Nor can I see putting energies and research into activities promoting capital growth and economic gain. Living sustainably off the land in community would have far more value. I may be accused of possessing a naïve view, but in my opinion the possibility of a more gentle, spiritual approach to living on this planet is very appealing to me and not one I'm likely to give up.

Across the country on the Atlantic coast, the Eskasoni Nation was working with Cheryl Bartlett to develop their guiding principle known as "two-eyed seeing" or *Etuaptmumk*:

> learning to see from one eye with the <u>strengths</u> of (the best in) Indigenous knowledges and ways of knowing, and from the other eye with the <u>strengths</u> of (the best in) Western knowledges and ways of knowing, and to using both these eyes together, for the benefit of all.
> (Bartlett, Marshall & Marshall, 2007, p. 14)

This principle arose from a concern the elders expressed when they observed that no students from their Aboriginal communities were going into the sciences (Bartlett, 2012). Mi'kmaq Elder Albert Marshall applied the term "two-eyed seeing" as a metaphor to signify that both Aboriginal and non-Aboriginal people alike benefit from the two ways of seeing the world. And while examples of contributions by western science in education are plentiful, evidence of Indigenous Traditional Knowledge (ITK) in science and science-related material is much less apparent (Bartlett, Marshall & Marshall, 2007), which is having a very obvious effect on Aboriginal students. Since the school system has considerable ground to cover before this guiding principle would truly be enacted, I quickly realized it needed to start in my classroom immediately.

When observing Indigenous epistemology through a *two-eyed seeing* lens, I am reminded of the similarities between it and what westerners term "ecological thinking." In the case of the former, native rituals around hunting and fishing ensure that an entire animal is consumed, either as food, as tools, or in ceremony, and no life is taken needlessly (Cajete, 2000). There is also an ethic around inter-species interactions and respect. No creature is any greater or lesser than any other. David Suzuki, a Canadian icon promoting environmental awareness and action, often makes reference to the fact that when many First Nations people make important decisions, they do so with the seventh generation in mind (Suzuki, 2010).

While I was learning about Native science, I also discovered the work of Capra (1996), who rekindled my love of science in a way that few else have. His conception of "systems thinking" is at the opposite end of the spectrum to reductionist thinking because it means looking outward and observing the world through its interconnections, as opposed to breaking it down into its component parts. One might say that Capra's systems thinking, or *ecological* thinking, aligns very closely with aspects of the Indigenous worldview (Kawagley, 1995). However, what made Capra's work especially instrumental in my growth as an educator was the fact that he was a

westerner speaking out against the modern, western paradigm. Before learning of his ideas, I was in great need of guidance and support from a western perspective in order to address my increasing sense of cognitive dissonance the more time I spent with my *Science Fact or Science Fiction* activities.

Looking back, I can see that I had a romantic vision of Native science, which at the time did not intersect with my western views. As a result, I continued to view the two as separate and looked for ways to insert Indigenous teachings into the regular curriculum. Capra, on the other hand, provided me with the western logic and language necessary to usher me away from reductionism toward a more holistic, *systems thinking* view, in which I could find ways to incorporate the regular science curriculum into an Indigenous approach. Between his and Cajete's ideas, I learned to comfortably create space for students regardless of their background by teaching science from a more respectful and inclusive perspective.

Exposure to Capra's philosophy pushed the boundaries of my thinking in many ways, especially when I read:

> Scientific theories can never provide a complete and definitive description of reality. They will always be approximations to the true nature of things. To put it bluntly, scientists do not deal with truths; they deal with limited and approximate descriptions of realities. (Capra, 1982, p.48)

This quote immediately reminded me of my lesson about Jonah and the whale (described in Appendix B) and I began to wonder if science, like the Biblical story, could be considered more figurative, or conceptual, than literal. This, in turn, caused me to question the validity of western, scientific descriptions of reality versus that of the oral, story-telling tradition of Indigenous Traditional Knowledge. Perhaps messages conveyed in myths are not unlike those that can be extrapolated from the theories of modern science. Because of my profound respect for Capra's insights at the time, I felt compelled to think deeply about his unorthodox outlook.

Doctoral Coursework Throws Everything Into Flux

As you may have noticed, returning to university as a science education instructor had a profound effect on me. However, returning to the university once more as a doctoral student led to yet another series of lessons, and not the kind you get from a textbook. As expected, we were provided with a course reading list, and it came as no surprise that we should begin our studies with Plato, the person responsible for founding the first Western institution of higher learning, the *Academy*, around 385 B.C.E. (Hummel, 1999). He also represents what I anticipated would be the level of scholarly discourse I could expect to find here. I was not disappointed. His portrayal of Socrates' Allegory of the Cave, in which long-time cave dwellers struggle to resolve their changing realities when they exit and re-enter a cave, pushed me to consider my own beliefs about reality, not to mention, confront the challenge of trying to understand his writing (reminiscent of my high school days trying to figure out Shakespeare).

Shortly after that, I began reading about Aristotle (384 BC – 322 BC), a student of Plato's responsible for writing the first comprehensive compendium of scientific and philosophical thinking in Ancient Greece, and "who created the scheme which was to be the basis of the Western view of the universe for two thousand years" (Capra, 2000, p21). The ideas contained therein were eventually adopted as the dominant view of science. I was surprised to learn that these writings were also translated, and initially only available to the Muslim world, until the latter half of the 12th century when they became widely accessible in the West (Shields, 2012). It would be another four hundred years after that before the Aristotelian worldview, which placed Earth at the centre of the cosmos, would cease to be the foremost teaching (DeWitt, 2010), at which time Copernicus would introduce his revolutionary ideas during the age of Enlightenment.

Speaking of revolutionary ideas, it was not until one professor casually remarked that in the time preceding the Age of Reason, science and religion once shared similar goals that I could hardly believe my ears. Had I just slipped into some alternate universe

where science and spirituality were uttered in the same breath? Could there be proof to this outlandish claim? I began my investigation immediately. To my surprise, Aristotle's treatise, *On Sense and the Sensible* (Aristotle, 350BCE/n.d.a), included references to, of all things, the *soul*. In fact, if I understood him correctly, the role of the physicist is to study the science of Nature (note the capitalization indicating reverence – not mine, by the way), and the best way to do that is to begin with the study of the soul as it provides the most insight (from *Physics*, Aristotle, 350BCE/n.d.c). To add to my state of disbelief, he asserted that the soul is the cause, or *source* of the body, and hence inseparable from it:

> the body corresponds to what exists in potentiality; as the pupil plus the power of sight constitutes the eye, so the soul plus the body constitutes the animal. From this it indubitably follows that the soul is inseparable from its body. (Aristotle, 350BCE/n.d.b)

Could he be implying that the body's functions cannot be understood or explained without acknowledging the role of the soul? Further examination of the Ancient Greek conceptions of the senses and the soul was most definitely required.

Additional investigation allowed me to clarify what Aristotle meant by his notion of *potentiality*, a term he used to distinguish the physical experiences of the body from those not yet felt by the senses that remain as potential. Worded differently, although senses possessed by the body enable us to know the external world, until those senses are enacted, their experiences exist as *potentiality*. To unlock this potential, therefore, there must be an agent of activation:

> It is clear that what is sensitive is only potentially, not actually. The power of sense is parallel to what is combustible, for that never ignites itself spontaneously, but requires an agent which has the power of starting ignition; otherwise it could have set itself on fire, and would not have needed actual fire to set it ablaze. (Aristotle, 350BCE/n.d.b)

I noted his use of the word "agent," and thought it to be synonymous with his conception of the *soul*; both acting on a different level than the senses, and necessary to "ignite" the knowledge of the outside world acquired through the senses. Interestingly,

I also remarked that the Platonists of this era believed the intellect, or *rational soul*, existed in the domain of the spiritual and was thought to reside in the heart (Mason, 1962). Yet, I am convinced that if you asked 100 Westerners today to indicate where their intellect resides, every single one of them will most certainly point to her or his head. Considering my upbringing in scientific doctrine, acknowledging that such a tremendous shift in perspective and perception had taken place since the days of Aristotle was not an easy thing for me to do. This caused me to be even more sceptical as the doctoral course progressed.

Next in our studies of the history of educational theory was Saint Augustine. (As an aside, it seemed a little odd to me that we were spending so much time studying Christian saints in a course on educational theory. I contented myself with the rationale that it was because they were the most learned individuals of the time.) In contrast to the inaccessibility of Aristotle's works, Saint Augustine was exposed to books by the Platonists (Saint Augustine, 400/2010) in the 4th century by Bishop Ambrose of Milan (Mendelson, 2012). Consequently, he adopted an approach similar to that of Aristotle, affirming that one can only *experience* the external world through the *senses*. Therefore, he adds, in order for a student to learn from a teacher, references to the student's prior sensual experiences are required (Mendelson, 2000). To me, Saint Augustine is speaking directly to teachers, reminding us that learning about the outside world is a private matter based on one's **subjective** experience of it. This notion of subjectivity in teaching is certainly not new, but it does challenge the current learning outcomes in science that cannot be *sensed* by the body.

Then how does one learn of the unseen world? Saint Augustine believes that as Christians, it is important to be knowledgeable about science and thus allow it to inform one's understanding of the Bible. Nonetheless, he affirms that when there are contradictions between the two, Scripture supersedes science:

> When they are able, from reliable evidence, to prove some fact of physical science, we shall show that it is not contrary to our Scripture. But when they produce from any of their books a theory contrary to Scripture, and therefore contrary to the Catholic faith, either we shall have some ability to demonstrate that it is absolutely false, or at least we ourselves will hold it so without any shadow of a doubt. (Saint Augustine, 400/1982, p. 45)

From this, I shall infer that he is taking the same position the Catholic Church tried to uphold during the Spanish Inquisition more than twelve hundred years later. Perhaps I should not be too surprised by the fact that I didn't learn about evolution in the '80s when I was attending Catholic school (also described in the journal entry entitled, *Learning About Evolution,* found in Appendix B).

Yet another aspect of learning, in Saint Augustine's view, is divine *Illumination*, which necessitates the presence of God in order for the mind to perceive elements of the intelligible realm, (which includes calculation, and hence mathematics, according to Plato [360BCE/2000]). In simplest terms, I believe he is saying that God must be present in the performance of certain functions of the mind. Here again, I am reminded of Aristotle's *agent*, which also necessitates the presence of an observer in the acquisition of knowledge. This causes me to wonder where and when such notions began disappearing from science and what difference this information might have played as I faced the dilemma about continuing in the sciences in university (also detailed in *Learning About Evolution*).

The Christian, scientific thread in the doctoral course continued, next exposing me to Saint Thomas Aquinas (1225–1274). I learned that he too had a link to the Ancient Greeks, evident in the number of commentaries he wrote on Aristotle's works. For example, in his critique of *On Sense and the Sensible* (Aristotle, 350BCE/n.d.a), Aquinas supports the claim that "intellect is the actuality of no part of the body, as is proved in *On the Soul III*" (Aquinas, 1800/2005, p. 16). He also clarifies that there are two types of science – those proceeding from principles originating in intelligence, like mathematics, and those originating from principles of *higher science*, like Sacred doctrine (St. Thomas

Aquinas, 1260/1993b). In the case of the latter, not unlike the theories of Aristotle and Saint Augustine, the principles are revealed by God.

As might be expected, I found Aquinas' use of the term, *higher science*, in reference to Sacred doctrine to be quite alarming, mainly because I had learned that science and religion were mutually exclusive. Discovery of such historical evidence compelled me to investigate just how far these seemingly heretical ideas extended. To my surprise, I struggled to locate writings in which theological thinking was ***not*** mixed with science. Let the following description of *miracles* stand as an example:

> THESE works that are sometimes done by God outside the usual order assigned to things are wont to be called miracles: because we are astonished (admiramur) at a thing when we see an effect without knowing the cause. And since at times one and the same cause is known to some and unknown to others, it happens that of several who see an effect, some are astonished and some not: thus an astronomer is not astonished when he sees an eclipse of the sun, for he knows the cause; whereas one who is ignorant of this science must needs wonder, since he knows not the cause. (St. Thomas Aquinas, 1260/1993a)

This style of communication in which God and science are intertwined is representative of most of the writings I read by Aquinas and Saint Augustine. However, as time went on, such expressions of the interrelationship between nature and the Divine purpose eventually faded and were replaced with a secular view of science during the period of the Enlightenment (Polanyi, 2009). Alas, this must be the moment in history when science and religion went their separate ways. I was not sure whether I felt more betrayed by the school system, the scientific community, or society at large for not informing me about this.

The degree to which Aristotle, Augustine, and Aquinas have been considered authorities on science is debatable. Nevertheless, it was important for me to include them since it was their ideas that set me into 'my tailspin' in the first place. Moreover, these ideas were instrumental in my awakening to a realization that what I learned in

school had been filtered through the lenses of both the Catholic Church and a Newtonian worldview. This, in turn, demonstrates for me the significant impact that worldviews can have on how we explain the world, which causes me to wonder if we can only ever learn *perceptions* of truths, as illustrated by Socrates' cave dwellers embracing their "shadow" reality. Finally and most importantly, these ideas not only remind me of the limitations of modern science, they give me permission to allow spirituality back into the conversation.

Before concluding this section, I'd like to add some final thoughts. So far, I've addressed scholars responsible for an initial opening of Pandora's Box (aka 'the tailspin'). It would be fitting to close with a brief mention of the other sources that had a profound effect on my subsequent quest to reunite science and spirit. First are the Indigenous-Aboriginal peoples mentioned earlier, who have been essential in presenting me with an alternative epistemology and ontology that fully integrates both practices, namely Cajete (1994; 2000), Elder Albert Marshall (Bartlett, Marshall & Marshall, 2007), Hampton (1995), and Kawagley (1995).

Second, I include Herbert Spencer (1865), English philosopher and biologist famous for the nineteenth-century question, "What knowledge is of most worth?" (p. 21). Remarkably, he spoke of a more intimate relationship between science and spirituality more than one hundred years ago. As a result, I find the following quote to be both relevant and inspiring:

> To all which add the further religious aspect of science, that it alone can give us true conceptions of ourselves and our relation to the mysteries of existence. At the same time that it shows us all which can be known, it shows us the limits beyond which we can know nothing. Not by dogmatic assertion does it teach the impossibility of comprehending the ultimate cause of things; but it leads us clearly to recognise this by bringing us in every direction to boundaries we cannot cross. It realizes to us in a way which nothing else can, the littleness of human intelligence in the face of that which transcends human intelligence. […] Only the sincere man of science (and by this title we do not mean the mere calculator of distances,

> or analyser of compounds, or labeller of species; but him who through lower truths seeks higher, and eventually the highest) — only the genuine man of science, we say, can truly know how utterly beyond, not only human knowledge, but human conception, is the Universal Power of which Nature, and Life, and Thought are manifestations. (pp. 92-93)

To me, Spencer is suggesting that a genuine understanding of science leads to a greater awareness of the "littleness of human intelligence" and toward a stronger appreciation of the Divine. Where was Spencer when I was fulfilling the requirements of my science degree? His words would have brought some solace.

Finally, I express gratitude for learning about Kabbalah. It has a 4000 year-old history that only became available in the last century when original documents were translated into Hebrew. While I tend to shy away from belief systems, I was drawn to its self-designation as a spiritual science, "an ancient wisdom that reveals how the universe and life work" ("What is Kabbalah?," n.d.). I was intrigued by the Tree of Life, a guide to moving into higher states of consciousness by letting go of the ego, as well as the comprehensive explanation of reality perception, which maintains that there exists a reality external to the senses (a belief shared with the Ancient Greeks). That is to say, our senses act as filters that send signals which our brain interprets, thus creating a version of reality that we think is real, but is actually only a depiction ("ARIfilms," 2006), or in Socrates' words, the "shadow" reality. And despite the fact that these ideas are four millennia old, they share similarities with today's emerging, holographic and fractal theories, discussed in the next section.

Quantum Theory Challenges the Newtonian Worldview

When Capra suggested I might have a crisis of perception, it was a significant wake-up call, which forced me to look into the causes behind such an accusation. However, when I learned that science and religion might have held a similar goal in their search for *Truth*, I realized I could not trust the textbooks or the media to keep me

appraised of the recent developments in science. I needed to take an active role in my own education, lest the rumours of neo-colonialism be true. Unfortunately, it was with great humility that I later learned I may have unconsciously propagated the "cognitive imperialism" to which Aikenhead referred.

On a more positive note, I acquired interesting insights as I educated myself about the history behind what I will refer to as *the fall* of the modern science paradigm. I call it this because, unbeknownst to many of us, there exists a theory known as quantum mechanics, which emerged a century ago that simultaneously called into question the nature of the sub-atomic world as well as Newtonian physics. In addition, I learned that this theory created much dissonance among the scientific community as sides began to form regarding how to explain why those invisible, sub-atomic entities disobey Newton's laws of motion. And although there is a good deal more to their stories than is presented here, the scientists described in this section have been selected for their contributions to my understanding of quantum physics as well as for the historical significance of their discoveries.

The first to be recognized is Thomas Young. He was the inventor of the famous "double-slit" experiment in 1802 (Young, 1807), which confirms earlier hypotheses that light travels in waves and contradicts Newton's light particle theory (Bowman, 2006). Consequently, his findings signify the beginning of the end of the Newtonian worldview. Fast forward a hundred years to 1900, when Nobel laureate Max Planck builds upon Young's discovery and shakes the world of classical physics by introducing the idea that emission and absorption of energy can only occur in discrete amounts (Gearhart, 2002). He called these packets, *quanta*, and they became foundational to Albert Einstein's renowned 1905 papers, allowing Einstein to generate a law from which "quantum mechanics" would emerge:

> Einstein's law of the photo-electrical effect has been extremely rigorously tested by the American Millikan and his pupils and passed the test brilliantly. Owing to these studies by Einstein the quantum theory has

> been perfected to a high degree and an extensive literature grew up in this field whereby the extraordinary value of this theory was proved.
> ("Nobel Prize in Physics 1921," n.d.)

Such a breakthrough is historically significant because it demonstrates once and for all that Newton's laws do not hold on a microscopic level. For me, it is personally significant because it forced me to deconstruct my version of scientific history, as these details had somehow escaped my high school science textbooks.

Advancements in quantum theory contribute to the work of Niels Bohr, who ascertains that matter could be said to exist only as patterns of probability (Bohr, 1928), an elusive behaviour also described by Werner Heisenberg's (1949) "Uncertainty Principle," where the more one knows about the *position* of an electron, the less can be said of its *velocity*, and vice versa. Such unpredictability causes Heisenberg to be tentative about trying to forecast electron behaviour, evident in his warning: "we have to realize that the word 'happens' can apply only to observation, not the state of affairs **between** [emphasis added] two observations" (1949, p. 46). Of course, these types of ideas make many physicists uncomfortable because they implied that reality was *probabilistic*, which diverged from the deterministic principles of the currently held paradigm (Friedman, 1994). In my mind, this reticence of scientists to acknowledge theories based on probabilities and uncertainties is indicative of the radical nature of what they were discovering. Since modern science had become so entrenched in logic and reason, it must certainly have come as a great surprise.

Meanwhile, Bohr's discovery that electrons could exist either as particles ***or*** waves, but not both simultaneously, further complicates matters. He calls this particle-wave phenomenon "complementarity" (Bohr, 1937), since you need the existence of both conditions to fully understand the paradox. That is to say, the apparatus you choose to conduct your experiment determines in which of the two states the electron appears. For example, if you use a device that looks for particles, you see particles. If you look for waves, you find waves. Moreover, the mere act of *observing* not only *collapses*

the wave function (Kiefer, 2003) from an infinite number of possibilities to a single outcome, it introduces a radical, new element into science – the presence of a *conscious observer*.

John Von Neumann (1996) has come to a similar conclusion as Bohr in *Mathematical Foundations of Quantum Mechanics*: "no matter how far we calculate -- to the mercury vessel, to the scale of the thermometer, to the retina, or into the brain, at some time we must say: and this is perceived by the observer" (pp. 419-420). His words underscore the importance of the conscious observer's role in the experiment and challenge the paradigm that all science can be known objectively. For me, this is a profound discovery because it addresses a long-standing issue I have with the portrayal of science and its pursuit of knowledge. In my opinion, modern science has not acknowledged that the scientist plays a part in the research, having us believe that its findings are 100% objective, untainted by outside influences. Yet since the 1930s, quantum theory has been suggesting that a conscious observer is not only present, but *instrumental* in the determination of experimental outcomes, and hence, in the construction of reality. I admit I was quite dismayed at learning this fact and continue to wonder why it is still being kept from mainstream science.

This perplexing conundrum has led Erwin Schrödinger to argue that the subjective thoughts and sensations of a conscious observer "do not belong to the 'world of energy', [so] they cannot produce any change in this world of energy" (Schrödinger, 1992, p. 127), which is why I find it surprising that he was the one responsible for a concept called "entanglement." Entanglement signifies the ongoing, inseparable relationship established between two quantum particles once they interact (Schrödinger, 1935), and is similar to John Bell's (1964) application of "nonlocality," meaning "that if two particles interact and then move apart, they continue to influence each other instantaneously" (Friedman, 1994, 34). Based on my findings, the concepts of *entanglement* and *nonlocality*, which attempt to explain the alarming, mysterious

behaviour of sub-atomic particles, have created both the dissonance and intrigue that still surround quantum theory today.

Openly opposed to these two notions, Einstein expresses his misgivings about "spooky actions at a distance" (Born & Einstein, 1971, p. 158) in a letter he wrote to Max Born. (As a side note, I would like to mention how delightful I found it to read the letters that Born and Einstein exchanged. I felt as though I was connecting with real people and not the iconic, crazy-haired images that have come to represent Einstein.) "God does not play dice" (Mermin, 1985), he insists, and dismisses the idea that physicists would not be able to one day explain these mysteries in scientific terms. He had already begun work on his "Unified Field Theory," in which he attempts to unify his theory of relativity with electromagnetism to explain reality in mathematical terms (Einstein, 1925), thereby connecting the quantum world with that of Newtonian physics. Unfortunately, at the time of his death, however, Einstein had still been unable "to arrive at a generally coherent and satisfactory theory, starting from the concept of a unified field" (Bohm, 1971, p. 371), which caused scientists to wonder if this might ever be possible. Ironically, almost every person in the Western hemisphere has heard of Einstein in spite of his failure, whereas few non-scientists know about Bohr, Heisenberg, Schrödinger, or Bell. I can only presume it has something to do with his alignment to the more popular, *anti*-uncertainty position at a time when the science community was not yet ready to accept the 'far out' notions of quantum theory.

In answer to the mysteries surrounding *nonlocality* and *entanglement*, David Bohm proposes that there exists a *field* in which particles are embedded that lies *outside* the space-time continuum (Friedman, 1994). This invisible field, which he calls "quantum potential" (later termed "zero point energy" by Harold Putoff [Pribram, 2009]), can transmit information to particles simultaneously in the same way a ship receives radio waves. Consequently, no matter where one particle is in the universe, once nonlocally entangled with another, both are connected via the invisible, quantum field.

Like many physicists, it has taken time for me to fully comprehend Bohm's idea and its significance. As I consider the implications that this level of interconnectedness would have, not only from a scientific perspective but from a spiritual one as well, I am not the least bit surprised that Bohm's field of quantum potential had difficulty penetrating the public domain or that his work was alleged to be metaphysical and ideological (Bell, 1982), causing it to be ignored by the physics community for many years (Friedman, 1994). I imagine that scientists decided it was safer to avoid such propositions than to openly attempt to confront and dispute them.

Nonetheless, Bohm continued his scientific pursuits. In 1959, he came across the teachings of Indian philosopher, Jiddu Krishnamurti, and shortly thereafter references to the "observer-observed" relationship begin to appear in his work, indicating the influences of his Eastern teacher:

> The "quantum" context thus calls for a new kind of description that does not imply the separability of the "observed object" and the "observing instrument." Instead, the form of the experimental conditions and the meaning of the experimental results have now to be one whole, in which analysis into autonomously existent elements is not relevant.
>
> (Bohm, 1971, p. 376)

Krishnamurti's wisdom has likely also played a role in Bohm's concept of *implicate order*, in which "everything is enfolded into everything" (Bohm, 1980, p. 225), and exists in undivided wholeness. Having myself been exposed to Krishnamurti, I can recall the way he challenged my own thinking about education and can see evidence of a similar effect in Bohm's writing. This causes me to speculate about the potential influence of Eastern thought on other Western science concepts. If the scientist is indeed in the science, then how might the Western paradigm differ if it was more open to alternative worldviews? I look at this question in more detail in Chapter 6.

Another intriguing possibility which Bohm presents is the idea that we exist in a *holographic universe* (Talbot, 1991). While I admit my knowledge of holograms is based

on the 'holodeck' in *Star Trek*, I certainly was not expecting the topic to show up in my research on quantum physics, and so can feel the pull from science fact toward science fiction. In an effort to more fully understand the concept, I defer to Bohm's (1980) description: "the key feature of the functioning of the hologram, i.e., in each region of space, the order of a whole illuminated structure is 'enfolded' and 'carried' in the movement of light" (p. 190). This sounds a lot like *fractals* – self-repeating parts organized such that when viewed as a whole, bear the same shape as the parts; a term I learned was both coined and illustrated by Benoit Mandelbrot (Mandelbrot, 1977). It is also reminiscent of Ken Wilber's theory of holons, which I discuss later. The similar, yet foreign nature of these ideas suggests to me that reality might not exist in the way I had conceived; a very perplexing thought which propels me toward further investigation.

Enter Nassim Haramein – physicist of the new millennium, unifier of Einstein's field equations (Jensen, 2011), and most engaging of my Youtube scientists. He reflects the openness and intrigue I associate with Bohm and his theories, since both maintain that finite, closed realities studied in the world of science can actually link up with the open-ended infinities of the spiritual domain (Jensen, 2011). In fact, Haramein describes them as lying on the same continuum, requiring no 'leaps of faith,' but rather sound science to move from one to the other. As a testament to this belief, he and colleague, Rauscher, present a remarkable, new solution to Einstein's field equations, which unite both "the gravitational force with the strong, weak, and electromagnetic forces in a unified theory" (Haramein & Rauscher, 2005, p 166) by incorporating torque and Coriolis effect.

While this discovery has certain significance for the physics community, for me it illustrates that seemingly disparate theories can be advanced with time and future knowledge. Not to mention, it unites both micro (sub-atomic) and macro (atomic) realities in a cohesive fashion, a mystery that could not be solved by Newtonian physics. A third possibility it presents is a union between science and spirit, putting an end to the

belief of their mutual exclusivity evident in the modern science paradigm. Incidentally, I am quite surprised at the ease with which Haramein speaks about the intersection between the scientific and the spiritual realms. He crosses the line separating the two so confidently that one would think what he says is a matter of fact. Sadly, Haramein has been accused of propagating pseudoscience ("Nassim Haramein," n.d.) by rationalists adhering to the old worldview for the reason I just mentioned. Regardless, I see him as a pioneer, who I suspect will someday gain the same level of respect as Einstein, and so I continue to be highly interested in his work.

Crossing the Threshold to Consciousness

As I follow the evolution of quantum physics toward implicate order, holograms, and a possible unification theory, the presence of a *conscious observer* who transcends space and time (Von Neumann, 1996) keeps reappearing. This causes me to expand my enquiry to incorporate the role that human consciousness might play in science if the modern paradigm were ever to be engulfed by a newer, more holistic worldview. Much to my surprise, I discover that early pioneers, namely Wilhelm Wundt, William James, and Edward Titchener had already been conducting consciousness research in the late 1800s, until their work mysteriously disappeared for nearly a century (Bachmann, Breitmeyer & Öğmen, 2007).

Re-embraced by the behavioural sciences in the 1980s, empirical studies on consciousness resume and the body of research multiplies. However, in 1995, philosopher David Chalmers alerts scientists to the fact that if they are ever to be capable of explaining consciousness in physical terms, they would first have to contend with what he calls the "hard problem" (Chalmers, 1995). That is, they must overcome the huge gap that exists between studying the physical systems of the brain in the *third* person and understanding what gives us a subjective experience where we feel things in the *first* person (Chalmers, 2004). Under the current scientific paradigm, which often

dismisses first-hand accounts as valid sources of data, one might say that the likelihood of this ever happening is questionable. Yet despite this seemingly difficult task, there is one body of researchers who are optimistic about uncovering a biological basis of consciousness linking subjective experiences to the brain, while a second group is looking *beyond* the physical for answers. This section provides examples of variations on the former, while the next section, *Beyond the Brain*, addresses the latter.

Among the pioneers of the "second wave," cognitive psychologist and co-founder of Society for Mind-Brain Sciences (Bernard Baars, n.d.), Bernard Baars (1987), conducted studies indicating that elements of a conscious experience could, for the most part, be located in the neocortex of the brain. Later, he explored how areas of the brain might exchange information as a consequence of conscious events, thereby developing the *Global Workspace Theory,* in which "consciousness is the primary agent [... which] enables access between brain functions that are otherwise separate" (Baars, 2003, p. 1). I find this particularly interesting because, although my original intent was to examine brain-based consciousness, Baars presents the idea that consciousness may be a *precursor* to intra-brain communications. In other words, instead of the brain producing consciousness, he proposes that the reverse might be true. This seems like quite a revolutionary idea, and one I feel would be difficult for scientists to accept, let alone prove. However, as I soon discover, subsequent research builds upon Baars' neocortex theory of consciousness nevertheless.

Among the first scientists to extend Baars' theory is John Eccles, who proposes that "psychons" (mental units of the mind) connect to the brain's dendrons via quantum physics (Eccles, 1992). He theorizes that mind-brain interactions occur at an interface between psychons (mental units) and corresponding dendrons (physical elements). He conceptualizes that through the evolutionary process, dendrons developed this "side-effect [...] capacity for interacting with the world of the mind" (p. 7322). Although Eccles' hypothesis provides the biological, missing link to explaining consciousness, and

overcomes Chalmers' "hard problem," the aspect that actually caught my attention was the fact that he refers to consciousness as a *side effect*, as if we were conscious *by accident*. I can't help but think that he did this on purpose, leaving open the possibility that an evolutionary or even a spiritual explanation might someday fill in the gap. Similarly, by introducing a notion like *psychon*, he appears to be using a scientific placeholder as if awaiting some future knowledge or technology. And what's more, publication of his ideas in scientific literature suggests this is an acceptable practice.

More recently, Baars joined forces with Gerald Edelman and Joseph Gally to produce a paper they entitled, *Biology of Consciousness*, in which they claim to have found "a strictly biological account of phenomenal experience and subjectivity that is consistent with mounting experimental evidence" (Edelman, Gally & Baars, 2011, p. 1). However, they explain that consciousness is not causal, meaning it is not directly linked to brain activity. Rather, they suggest that the *underlying neural mechanism* which correlates to conscious experience is causal (p. 5). Yet interestingly, they do not say how.

What makes this article especially notable is the authors' contention that their hypothesis solves Chalmers' "hard problem" by applying the following logic: in order to have conscious experiences, one must possess a functioning set of brain structures. And although these experiences are subjective in nature, an individual's account of them can be studied through their correspondence with third-person observations. While this argument seems perfectly coherent, it highlights how these researchers address the gap between the *subjective* and *objective* by making reference to a 'something in between' that they cannot actually explain. This affirms to me that yet again, there are cases in which unknowns are being acknowledged and accepted in scientific research, and they appear to be accepted in the interim until better explanations come along.

By this time, contemporaries Christof Koch and Nobel Laureate, Francis Crick, had already invested two decades into their neurobiological theory of consciousness. Having

isolated the neural activity that takes place while one is *visually aware* on a conscious level and comparing it to the neural activity while in a *visually unconscious*, 'zombie' state, like driving, they put forth their hypothesis regarding "neural correlate(s) of consciousness (NCC)" (Crick & Koch, 2003). Regrettably, they were unable to produce any conclusive evidence in their endeavours, which to me suggests that we are still a long way from being able to attribute consciousness to brain activity. Nonetheless, they continue to believe that the neurons or neural pathways associated with consciousness will one day be found, but acknowledge that a complete theory must be able to link the physical architecture of the brain to Chalmers' "hard problem" involving the subjective experience. Once again, publication of their research seems to confirm that the field of consciousness studies is more open to and accepting of untested placeholder ideas than I had ever been led to believe about science as a student.

Interestingly, in their list of acknowledgements, Crick and Koch thanked Patricia Churchland, the first of the females I came across in my brain-based consciousness research. It turns out that she's a Canadian specializing in the philosophies of neuroscience, of mind, and of neuroethics, not to mention an author of several books and countless articles addressing brain research ("Patricia Churchland," n.d.). In order to get a sense of her philosophical stance regarding the nature of consciousness, as well as broaden my exposure to current theories, I have conducted a survey of her articles. Below are a select list of quotes which, in my view, fairly represent her position:

- "I am predicting that explanatory power, coherence and economy will favor the hypothesis that awareness just *is* some pattern of activity in neurons" (Churchland, 1994, p. 31).
- "Supposedly, something sets consciousness apart from all other macro-function brain riddles such that it stands alone as The Hard Problem. As I have tried to probe precisely what that is, I find my reservations multiplying" (Churchland, 1996, p. 402-403).
- "Brains manipulate inner models to predict the distinct consequences in the external world of distinct behavioral options. The self thus turns out to be identifiable not with a nonphysical soul, but rather with a set

of representational capacities of the physical brain" (Churchland, 2002, p. 308).

- "One is one's brain" (Besandoun & Faye, 2005).

Perhaps the most remarkable thing about reading through Churchland's articles is how philosophically opposed her ideas are to mine. She seems certain that the origin of consciousness will someday be proven to dwell in the brain.

In Owen Flanagan's (2007) estimation, this type of attachment to causal explanations of consciousness is representative of a significant portion of "mind" scientists. In his book, *The Really Hard Problem: Meaning in a Material World*, he echoes an opinion expressed by Koch (2012): if consciousness cannot be localized in the brain, it will have to be reclassified as an *epiphenomenon* – "a secondary mental phenomenon that is caused by and accompanies a physical phenomenon but has no causal influence itself" ("epiphenomenon," n.d.). However, brain-based consciousness researchers do not study *epiphenomena*. The idea that consciousness might not have any causal influence is not one entertained by materialist, mind scientists since it means they would ***never*** find what they are seeking using current scientific approaches. I find this particularly intriguing because in my mind, despite their differences, the belief in a potentially mythical future event held by mind scientists possesses the same element of mystery as does an epiphenomenon.

Alas, I have come to the conclusion that restricting consciousness to the brain is both inaccurate and incomplete. And I am not alone. There are many researchers who believe that no single approach (neither physicalist/objective nor non-physicalist/subjective) would ever be able to explain consciousness on its own (Bentov, 2000; Flanagan, 2007; Jack & Shallice, 2001; Vandekerckhove & Panksepp, 2011). Even Christof Koch (2012), in his most recent book, *Consciousness: Confessions of a Romantic Reductionist*, expresses misgivings when he writes: "physicalism by itself is too impoverished to explain the origin of the mind" (p. 152). The dilemma facing Koch about

entertaining *non-reductionist* ideas is analogous to the same hurdle I believe modern science is attempting to jump right now. Scientists find themselves on both sides of, and straddling, the proverbial fence when it comes to reconciling the mind-body conundrum: those who insist a physical explanation is forthcoming, those calling for a new, scientific worldview, and those somewhere in between.

As a final consideration regarding brain-based consciousness, I have discovered that the study of *metacognition* might suggest the way forward. Since cognitive scientists have traditionally assumed that cognition resides in the brain (Blomberg, 2011), it seems plausible that the phenomenon of metacognition, or *awareness of the self*, implies "a special state of consciousness" (Metcalfe, 2008). Furthermore, it presents an interesting conundrum, which Janet Metcalfe likens to "Comte's paradox" – the idea that cognition is somehow able to observe itself. In other words, an observer could both *be,* while thinking about itself *being* (reminiscent of Descartes' mind-body problem).

Metcalfe's ideas prompt me to speculate about the potential implications for my study, since I have come to see myself as both the *sculptor* and the *sculpted* through this process. If my participants and I were to metacognitively recall events and make judgments about these recollections, would there be conclusions I can make about *conscious awareness* involving metacognition? And if so, would these results somehow demonstrate that my own consciousness might reside in the brain? Since the science to date cannot conclusively state whether or not this is the case, it leaves room for more radical ideas, which I shall now explore.

Beyond the Brain

The fact that consciousness "cannot be weighed, measured, or otherwise pinned down" (Russell, 2004, p. 27) has been highly problematic for those subscribing to a modern science paradigm, which is likely the reason why it has generated so much

controversy in the scientific community. Nonetheless, there seems to be a growing body of scientists, many of whom are physicists, that are not only open to but excited by the prospects of studying consciousness despite the evidence that it may lie beyond the physical world. A number of these individuals have been using the language of quantum mechanics to support their theories, while others have offered entirely new propositions. Examination of their ideas has probably been the most exciting part of this literature review because it reaffirms the possibility that I might just have found my science-spirit intersection hidden in their research.

Most of the work that relates consciousness to quantum mechanics does so more from a philosophical perspective than a literal one. Scientists acknowledge that they are still far from understanding the inner workings of consciousness (Koch, 2012; conscious summit, 2011), let alone being able to name the mechanisms from which it stems. As noted earlier, however, this area of scientific research in particular seems quite open to surmising, conjecturing, and entertaining radical, new ideas, which I have learned is even more evident when it comes to explanations involving quantum mechanics. Consequently, the paradigmatic change inspired by the presence of a conscious observer, as proposed by Bohr, Heisenberg, and Von Neumann, is motivating frontier scientists to apply principles of nonlocality and hence, push them far beyond the realm of the physical.

Stephen Lewis is one such alternative-medicine practitioner who has developed the Quantum Evaluation Device (QED), which measures the energetic imbalances of a person, then applies the necessary balancing frequencies (drawing from a database of more than half a million frequencies) to aid in healing (Lebowitz, 2008). Having discovered that *anything* unique to an individual, e.g., blood, hair, fingernails, or even an image, possesses her or his *essence* (Hladek, 2009), he found that he could attach a representative item (usually a photo) to the device, and subsequently assist in bringing the person's energetic state into harmonious balance. This occurs by "focusing [...]

consciousness to remove the disturbances in the energetic matrix," claims Lewis (Lewis & Slawson, 2000, Epilogue), and consequently brings about the *healing* process. He asserts that it must be achieved internally via a person's higher levels of consciousness and distinguishes healing from *curing*, in which something acts externally to remove a disease, like a surgery or drugs (Lebowitz, 2008).

Reading about Lewis' alternative healing technique is intriguing but stretches my limits as far as knowledge of *personal frequencies* is concerned. How exactly does an object belonging to an individual resonate with a unique frequency? I recall learning that there are people in India who believe a guru's photo carries her or his personal energy. And I've heard some Asian cultures do not like to have their photo taken because they believe it captures a piece of their soul. Perhaps the QED device is simply a North American application of the same principle of linking images to human essences, and Lewis is setting us on a path that might lead modern, Western science toward ancient, Eastern philosophies, especially since sources from the East acknowledge an openness of their cultures to embracing a broader interpretation of science (Peterson, 2002; Lama, 2005).

Similar to Lewis' technique of measuring a person's frequencies, Russian physicist, Dr. Konstantin Korotkov (2004) has been exploring biological applications for a camera he has created that captures *auras,* or *quantum fields,* which extend out from the body of living things and reflect their states of consciousness. He has developed the Gas Discharge Visualization (GDV) technique based on an earlier invention by Semyon Kirlian, which produces images revealing a human's physical and emotional conditions (Toolan, 1983). Benefits of using his device include a non-invasive means of diagnosis, objectivity, and low cost (Gagua et al., 2004). Although in recent years, GDV has extended beyond diagnoses to studying the effects of treatment, exercise, meditation, and virtually any other application that involves the state of a living being (Cioca, Giacomoni & Rein, 2004; Peterson, 2002). I highlight the use of the term "living being" since his device is capable

of capturing images from plants and animals as well. In an interview, Korotkov jokes that vegetarians who don't eat meat for ethical reasons will have to rethink their logic once they find out about his research involving plant auras (Peterson, 2002).

Although this *quantum field* technology has been around since the '60s, it was not embraced by Western science until several decades later. Once again, we see a reluctance to accept or adopt unconventional ideas, or in this case, technology. Having heard that Russians are far more eager to embrace such scientific advancements, I was fascinated by Korotkov's explanation:

> Russian science has always been open to new ideas. It became even more so after the collapse of the Soviet empire. From that time on, Russian people and scientists became aware that everything could change in a short time, and that nobody knows what can happen in the next couple of years. [...]
>
> In the United States, scientists are very restricted by the structure of how scientific work is organized. In Russia, scientific pursuits are very low paying. Scientists do not depend on payment. We have no salary — so we are free to do what we want. Having only a little money, we can organize really interesting research work. (Peterson, 2002)

Korotkov reports that today GDV machines are not only certified medical instruments in Russia, they are used by thousands of medical practitioners throughout Europe and around the world ("Dr. Konstantin G. Korotkov," 2012).

Thus far, I have learned that the body can communicate invisible information if we know how to look for it. In his book, *Power VS Force,* David Hawkins (2002), psychiatrist, physician, and remarkable pioneer in the field of consciousness, expands on this concept. In his case, however, the technique is called "kinesiology" (often confused with a field of study in the biological sciences), and does not require any intermediary device. Furthermore, as declared in the book's opening sentence, Hawkins reveals: "While the truths reported in this book were scientifically derived and objectively organized, like all truths, they were first experienced personally" (Hawkins, 2002, p. 9). I

am particularly drawn to the latter half of the comment, in which the author appears to be suggesting that all truths are first and foremost, subjective experiences. As for the scientific truths that derive from his subjective ones, he is referring to a chart entitled, *Map of Consciousness,* in which he presents increasing levels of consciousness. His map shows levels, or *calibrations*, ascending from 20 (the level of shame) to 700-1000 (the level of enlightenment), with progressions such as 150 (anger), 250 (neutrality), and 500 (love) in between (Hawkins, 1998, pp. 52-53).

Hawkins' kinesiology method is highly subjective, since it involves the use of one's muscles as a means to gain insight into, well, anything in the universe; even questions unrelated to consciousness. The proper way to apply the procedure is for one person to lightly push down with two fingers on the wrist of the horizontally-extended arm of a second person, who is holding a declarative statement in her or his mind (Hawkins, 1998). For example, in my case, if I want to know what level of consciousness I have, I or an assistant would say something to the effect, "Susan's level of consciousness is ___." Next, I or an assistant would state values in sequence, e.g., "100, 200, 300" and so on, while giving a downward push on my arm as each value is spoken. A weak muscle response gives a negative, or 'no' result, while a resistant, strong arm yields a positive 'yes.' Curiously, arm strength does not come into play.

Part of my motivation for including details of Hawkins' method is to illustrate how far it strays from traditional Western science. Information is collected via a connection between the physical self and some greater, *infinite knowing* to which the body has access. I wonder if the level of consciousness we possess can be considered an indicator of the degree of access we have. According to the map's creator, the highest possible value of human consciousness is 1000 and has only been demonstrated by the "Great Avatars," namely Krishna, Buddha, and Jesus Christ (Hawkins, 1998, p. 76). (I would be curious to hear how Aristotle or Saint Augustine might interpret this.) A second motivating aspect is the fact that, to arrive at his chart, Hawkins claims to have

applied rigorous scientific testing to produce seemingly 'non-scientific' results, linking physical responses of the modern science world to abstract thought, considered by some to be more from the ethereal realm.

In Hawkins' view, his process has yielded a tool providing "a practical map of the energy fields of consciousness" (Hawkins, 1998, p. 51), which correlates to the "morphogenetic fields" studied by biologist Rupert Sheldrake (2006):

> These are rather like invisible blueprints that underlie the form of the growing organism. But they are not, of course, designed by an architect, any more than a "genetic program" is supposed to be designed by a computer programmer. They are fields: self-organizing regions of influence, analogous to magnetic fields and other recognized fields of nature. (p. 32)

More recently, Sheldrake expanded upon this idea by creating an overarching classification he calls "morphic fields," which includes not only morphogenetic fields, but behavioural, mental, social, and cultural fields as well. It exists around the system it organizes and coordinates the behaviour of elements under its influence (Sheldrake, 2006, p. 32), as beautifully demonstrated by the majestic formations made by a flock of starlings. And not unlike the concepts of nonlocality and entanglement, members of a morphic field remain connected regardless how much distance separates them, which the author adds is how pets know when their owners are coming home (Sheldrake, 2011).

A further, more controversial development of Sheldrake's hypothesis is "morphic resonance": "The means by which information or an activity-pattern is transferred from a previous to a subsequent system of the same kind" (Sheldrake, 2006, p. 33). It is reminiscent of the infamous "Hundredth Monkey" (Watson, 1979) analogy, in which a critical mass of monkeys on one island is able to mysteriously transfer their new technique for washing sweet potatoes to nearby islands despite the fact that the monkeys have no physical contact. However, in Sheldrake's case, monkeys of the same

breed, regardless of where in the world they live, are able to wash the potatoes *more rapidly* once the initial skill has been acquired. Not surprisingly, like others before him, Sheldrake has been accused of propagating pseudoscience (Maddox, 1981; McManus, 2013), highlighting once again the insistence of scientists to restrict topics to those that are testable, measurable, and reproducible.

Thus far, I have mentioned fields, personal frequencies, auras, calibrations, and morphic resonances. However, looking back on my own science education, at no time was I exposed to the remotest possibility that we might be *more* than our bodies. Contemplating such implications causes me to wonder about the origins of such expressions as, *you could cut the tension with a knife*, or, *I could feel someone watching me*. Are the technological instruments and techniques described above actual confirmation that we extend beyond the boundaries of our skin? And if so, I have to ask myself, *Where do I end and you begin?* In my research, I have come across several individuals whose work just might offer some important insight regarding these questions.

Where Do I End and You Begin?

Years ago, I came across Lynne McTaggart's (2001, 2008, 2011) study of "fields," whose conceptual origins might be traced as far back as Schrödinger's *entanglement* or Bell's *nonlocality,* since the three terms propose "that all matter in the universe is connected on the sub-atomic level through a constant dance of quantum energy exchange" (McTaggart, 2008). As I look back on McTaggart's work, I am reminded of Bohm's idea of radio waves invisibly transmitting information over *fields,* since it seems to parallel the former author's description of "intention experiments":

> Researchers at the Institute of Noetic Sciences [IONS] in Petaluma, California discovered that when one member of a couple sent healing thoughts and intentions to his partner with cancer, a large number of

> physiological processes–heart waves, brain waves, conduction of electrical impulses in the fingertips, blood flow, respiration–began to mimic each other in both partners. (McTaggart, 2011, p. 63)

IONS researchers have also discovered that intention alone might be responsible for influencing experimental outcomes via a phenomenon known as "entrainment" – "a term in physics which means that two oscillating systems fall into synchrony" (McTaggart, 2008, p. 52). Surprisingly, entrainment can take place between strangers (McTaggart, 2011, p. 62) as well as species (Buccino et al., 2004). Such findings confirm that we do not exist as isolated organisms. Instead, we are both physically and invisibly connected. What remains to be discovered is exactly how far this interconnection extends.

This phenomenon is reinforced by other studies as well. For example, research from the HeartMath Institute shows that an electromagnetic *field* produced by one's heart (found to be 5000 times stronger than that of the brain) can not only be detected by magnetometers several feet away, but can also interact with the hearts of other humans up to five feet away (McCraty, 2010; McCraty, Bradley, & Tomasino, 2005). Similarly, Dean Radin and Marilyn Schlitz's (2005) double blind study reveals that participant *receivers* attached to electrogastrograms (EGGs) demonstrate measurable "gut feelings" which correspond to the emotional responses of participant *senders,* as the latter view negative-, neutral-, and positive-provoking images at another location. "This experiment suggests that some somatic feelings may be associated with perceptions transcending ordinary sensory capabilities" (Radin & Schlitz, 2005, p. 90), which supports the findings that our bodies possess elusive capabilities to transmit and receive signals from the outside world. From a modern science perspective, the data is solid. However, in terms of what its implications might be, I believe this makes many Western scientists uncomfortable. This could explain why not all institutions are pursuing these topics at the moment, and perhaps even why so many researchers in this field have been accused of propagating pseudoscience. [I also wish to add that while

other researchers like Gregg Braden (2008) and A.K. Mukhopadhyay (2012) among others, have all made wonderful contributions to the topic of *fields* and to my enquiry, it would require yet another dissertation to examine them in a way befitting of their research.]

Perhaps the most surprising discovery I have made to date regarding shared *fields* involves "mirror neuron" research (Pellegrino, Fadiga, Fogassi, Gallese, & Rizzolatti, 1992). In McTaggart's (2011) most recent book, *The Bond: Connecting Through the Space Between Us*, she captures the magic of a moment in mirror-neuron history in this way:

> Rizzolatti was thunderstruck when it finally dawned on him what might be happening: the *very same neuron* in the monkey's brain that fired when it intended to grasp the object in the Black Box was also firing when the monkey *observed* the researcher grasping it. (McTaggart, 2011, p. 55)

Such an observation must have come as quite a shock to the researchers present. To imagine that the monkey's brain makes no distinction between *its* intention and the *human's* action defies logic from many scientific perspectives. It immediately occurs to me that the two brains might be connecting nonlocally, in the same way that sub-atomic particles do, for as McTaggart illuminates:

> If you were able to get inside your own head and observe your brain and nervous system in the act of relating to someone else, you'd be hard pressed to figure out which instructions relate to you and which to the other person. (2011, pp. 59-50)

I must say, I am surprised that materialist science which prides itself on physical evidence has gotten so close to what I believe to be the science-spirit interface, since Giacomo Rizzolatti's experiment appears to illustrate that the monkey's brain is acting synchronously with the researcher's brain.

Further physical confirmation that we extend beyond our bodies is provided by Bruce Lipton, cellular biologist and geneticist known for being a pioneer in the field of

epigenetics – "the science of how environmental signals select, modify and regulate gene activity" (Lipton, 2008, p. xii). In the sixties, Lipton (2006) discovered that when activated under normal conditions, progenetor stem cells, called "myoblasts," form muscle tissue. However, when they encounter a second environment with different conditions, they form bone. In a third and equally surprising event, myoblast cells from the original culture that are placed in yet a third set of varying conditions become fat cells. To his and the biological world's amazement, this data allows Lipton to state conclusively that environmental factors and **not genes** determine the fate of the cells.

Consequently, these findings contradict the notion of genetic determinism in which we are "victims of our genes" (Lipton, 2008, p. xxix). This is a landmark discovery because it provides further physical evidence that we are who we are *in relation to* our environment, an outcome, Lipton (2006) claims has an even greater effect on society than the acceptance of quantum mechanics. In other words, we don't just end at our cell membranes but continue *beyond* into the external world, as suggested by all of the scientists in this section. This finding aligns with the notions of nonlocality, entanglement, and fields, which is further confirmation to me that we are just beginning to understand the nature of our existence. (As an interesting parallel to my own dilemma, Lipton felt compelled to resign his tenured, university position because he could no longer teach medical students the outdated dogma he knew to be wrong.)

Intrigued by this notion that we might be more than our bodies, I was drawn to neurosurgeon Eben Alexander's (2012) autobiographical account of his experience during a week-long coma, which he describes in the book, *Proof of Heaven*. His story is especially pertinent to my investigation, not because of his expertise in brain functioning, but because he is able to relate his experiences during a time when, to the outside world, he was in the coma and had absolutely ***no*** brain function. I was certain Alexander would be able to provide unique insight into the phenomenon of near-death experiences (NDEs) now that he was on the other end of the scalpel. And for someone

with his background and status in the medical community, I figure he should have credibility on the topic since he can address it from both sides.

Alexander's main points that speak to my research include his contention that consciousness is not located in the brain. In his view, the very essence of who we are extends much further than he could have imagined. He bases this conclusion on the *conscious* journey he took through multiple "realms," each having its own perspective and perceptions, and all while exhibiting zero brain activity. When describing one of the higher *realms*, he recalls:

> It seemed that you could not look at or listen to anything in this world without becoming a part of it – without joining with it in some mysterious way. [...] you couldn't look *at* anything in that world at all, for the word *at* itself implies a separation that did not exist there. Everything was distinct, yet everything was also part of everything else. (Alexander, 2012, p. 46)

He speaks of countless universes and multiple dimensions. He makes reference to the three-dimensional world of time and space that is our reality and how it is "tightly and intricately meshed within these higher worlds" (p. 49). He also acknowledges that the limitations of our perception and language reduce the sharing of his experiences to tiny fractions of the *real* sensations that made up his travels.

I have to admit that I find Alexander's account extremely compelling. He, along with the world's leading NDE experts, Raymond Moody (1977) in the United States, and Pim Van Lommel in the Netherlands, present evidence which appears to demonstrate unequivocally that consciousness cannot reside solely in the brain. One such example includes Barbara Bartolomè, who describes an account in which she passed out on an operating table only to open her eyes and witness the medical staff scurrying around as she looked down on them from the ceiling (Perry & Crouch Jr., 2011). When she returned to her body after a pound to her chest, she was able to tell the people in the room who had done what to her while she was clinically dead, which she claimed then led to avoidance by the hospital staff for fear of a possible lawsuit. Clearly, these actions by the

staff confirm that what Barbara said was true, otherwise they would not have restricted communication with her following the incident.

Perhaps even more compelling are the "shared death experiences" that are reported by loved ones who are present at the deathbed of a friend or family member (Moody, 2011). They are able to provide details of an event, like going down a tunnel or having a "life review," that they experience simultaneously with the person who is dying. These first-person accounts create real havoc for the scientists and medical professionals who attribute NDEs to brain dysfunction for at least two reasons: first, those describing what took place are healthy individuals with normal brain function, and second, in a number of cases there are several people present who can testify to having the same experience. In my mind, these scenarios offer the greatest potential for pursuing the science of NDEs and beyond, since it is almost impossible to argue with these two points.

One way to comprehend NDEs is through Van Lommel's (2004) use of an Internet analogy. In his view, the brain is the receiver and transmitter of signals from and to fields of consciousness, much like a computer is the receiver/transmitter of the Internet (although neither the brain nor the computer actually generates these signals). Into this scenario, he incorporates wave-particle theory by equating subjective consciousness to waves and the physical brain to particles. In physical terms, conscious activity can be measured by EEGs, magnetic resonance imaging (MRI), and other devices. However, when the brain ceases to function, it only means that the particles no longer exist, whereas consciousness persists in its eternal wave form, independent of the body (Van Lommel, 2004, p. 128). Logically, this appears to be a sound explanation, which I believe very aptly describes people's accounts of NDEs while their brains lie dormant. However, providing reasons as to why perfectly healthy people are able to share in the NDEs of dying loved ones will require a significant expansion of the currently held scientific paradigm before we have the language and the means to understand these occurrences.

By locating consciousness outside the brain, Van Lommel also reinforces Descartes' dualist mind-body split, although in this case it might more appropriately be called the "consciousness-body" split. Coincidentally, Lipton recalls coming to a similar realization along his journey:

> What hit me at that moment as being a strictly materialist, physical biology guy was that at that very minute, I realized, what if my identity is being picked up from the environment. Then if my cell is here, or my cell is not here, it doesn't make any difference to the existence of my identity. It's still part of the environment. Oh my God, I'm not even in this thing. I am a signal being picked up playing through this body. Immortality is a given. It's the body that comes and goes. Not the field of information of my identity. That's always there. [...] We're earth rovers. We receive information. Experience information. Then return it to the source. I asked a question to the universe which then my cells answered... I exist as a field energy, as a spirit, as information in the field and I also exist as a body.
> (Robison, 2012a)

In Lipton's case, however, he speaks in terms of *identity*, which might correspond to Van Lommel's conception of *consciousness*. I believe Lipton is referring to a *sense of self* that emerges as we experience this reality by picking up signals from the environment. This brings me to my next question, *What constitutes reality?*

What Constitutes Reality?

In an attempt to solve the dilemma regarding what constitutes reality, I shall deviate from the topic of consciousness for a moment to present some of the current literature on the subject. During my search, I have come across an eye-opening video suggesting that we may not actually see with our eyes ("ARIfilms," 2006). Pardon the pun. Instead, our eyes transmit signals to the brain where, from the reductionist point of view, neural impulses give an observer the conscious experience of seeing. However, from a dualist perspective, the brain sends these visual percepts on to the mind, which then converts them to the experience of seeing (Velmans, 2009). Max Velmans, on the

other hand, has a third opinion. He argues that what one sees, even if only phenomenally, is the *real* thing: "the human knower and the means of knowledge available are a particular manifestation of the thing itself" (Velmans, 2009, p. 205). Regardless to which of these interpretations one subscribes, they present some difficult questions: Where is the reality that we perceive? In our heads? And if so, how is it created? How is the brain involved?

To avoid being too overwhelmed by the theory, I decide to investigate what researchers have found out regarding how we perceive reality. I quickly locate this information: "The ratio of what we sense to what we perceive is 1,000,000 to 1" (Nørretranders, 1999 p. 161). Furthermore, as far as human communication goes, we are only able to express up to 50 bits per second (p. 144) of what we perceive. From this perspective, I am able to deduce that what we perceive as our reality is only a mere fraction of what potentially exists in the *outside* world. This must mean that there exists some system of filters which acts on the vast amount of incoming information and process it down to a manageable amount.

As I think about potential filters that might influence our perception of reality, I recall hearing about the breakfast programs that started up in schools a number of years ago. They were apparently based on research indicating that students cannot learn as well when they are hungry. I think to myself, perhaps hunger is a filter. Then what about how we perceive reality during emotional, painful or drug-induced states? Have these situations been filtered as well? In the case of cultural filters, Richard Nisbett (2003) is able to shed some light based on a study he conducted which measures participants' accuracy of recognition and processing speed as they report what they can remember seeing in images they were previously shown. He notes that "Americans on average found it harder to detect changes in the background of scenes and Japanese found it harder to detect changes in objects in the foreground" (p.191). From his findings, it is

easy to infer that culture, among other factors, plays a very important role as a filter in our perception of reality.

Figure 2.2: Testing Perception

Although I have only conducted a preliminary investigation into perception of reality thus far, I continue to wonder if we might ever be able to say with any confidence that there exists *one objective reality*. To illustrate this point, consider the image in Figure 2. Whether one sees a cup or the profile of two heads facing each other is entirely up to the perceiver, despite the fact that the *data* are the same. If we extend this to what we currently proclaim as scientific truths, how can we be sure that we haven't presented *filtered* perceptions of the data and not the objective reality? In all honesty, I don't think we can, at least not at the present moment. Therefore, with respect to my original enquiry into what constitutes reality, I have decided upon a very loose, subjective definition – *what we perceive to be our experiences*. Consequently, what you are now reading is a description of *my* reality in terms of my perception of it. And having mentioned my worldview in the last chapter, you already have a sense of several of my filters. Hopefully, with these pieces of information, you will be able to arrive at your own conclusions regarding my portrayal of reality, filters, the nature of science, and my overall journey documented here.

Because he offers another conception of reality as it relates to the topic of consciousness, I shall conclude this section with some insights from cognitive

psychologist, Ken Wilber. In his view, reality is composed of "holons" (Wilber, 2000), which refer to *wholes that make up other wholes,* not unlike Mandelbrot's fractals. He illustrates their relationship in this way: atoms are whole, yet parts of molecules, which are whole, yet parts of prokaryotes, which are whole, yet parts of eukaryotes, etc., and this pattern of holons proceeds infinitely in both directions (Wilber, 2007, pp.27-28). As a result, each level of holons builds one on top of (or beneath) the other, adding depth to the holon hierarchy, or *holarchy*. Consequently, the greater the depth that develops, the greater the *consciousness* that the holarchy possesses (p. 60), where "consciousness can be loosely described as a 'perspective-making, perspective-taking' system that creates, collects, and organizes deeper, wider, more sophisticated points-of-view as it develops" (deVos, 2010).

As I consider Wilber's proposition, it occurs to me that his holarchy provides the missing link between reductionist thinking and systems thinking, where the former looks in one direction (toward the parts) and the latter looks in the other (toward the wholes). I also understand his theory to suggest that depending on the level at which you enter the holarchy, that will determine the levels of consciousness you observe there. In other words, if you enter at the level of a human holon, you will see the human levels of consciousness. In contrast, I suspect that if you enter at the level of an atom, the chart, if there was one, would look very different. Not to mention, it would imply that atoms possess consciousness, which I think we've already determined would be considered pseudoscience by many, particularly if the atom was in, say, a rock.

By compiling the work of over 100 Eastern and Western thinkers (Wilber, 2000, p. 85), Wilber has created a chart that portrays the progression of increasing consciousness (2007, p. 218). He does so by applying the metaphor of a climber. On his chart appear the *rungs* of a climber's ladder, which correspond to the levels or *spheres* of consciousness, with states such as: sensoriphysical (F1) and phantasmic-emotional (F2) occupying the lower rungs, and states such as: vision-logic (F6), psychic (F7), subtle (F8), and causal

(F9) occupying the higher rungs. Also included are the fulcrums (F1 through F9 above), or *steps*, that the climber, or *self*, must negotiate during the climb. He further contextualizes these progressions by comparing them to three theorists' models of consciousness (Maslow's self-needs, Loevinger's self-sense, and Kohlberg's moral sense). One has simply to place herself or himself on the chart according to which level is the best fit.

I am hesitant to admit that when I came across this chart, I was both excited and relieved, probably because it felt like the first remotely tangible research I had found relating to consciousness, especially after reading so much research filled with complex, abstract concepts. (By tangible, I mean something that I could use personally. And although I've discussed Hawkins' chart first, I did not discover it until after I found Wilber's.) Or maybe it was because I could satisfy a need I had acquired in elementary school to figure out how *high* a score I might receive, and then congratulate myself accordingly. As I reflect on this reaction, it occurs to me that such a strong desire to *measure* consciousness might stem from my Western schooling. I was never really exposed to open-ended topics in science, like consciousness, that provided me with the tools to make sense of them. As I said earlier, if you couldn't test it, measure it, or reproduce it, we didn't discuss it. Therefore, I shall take the time now to expand my horizons by looking to the Eastern philosophies for some insight regarding alternative perspectives.

Eastern Philosophies Might Hold the Key

When Radin states, "The wisdom of the past [and] the future of science will intersect and both will be better as a result" (Robison, 2012b), he is acknowledging the power of a union between the wisdom of the ancient Eastern traditions and the frontier science emerging from the binds of old-world thinking. These sentiments are echoed by Elder Albert in "two-eyed seeing," and the Dalai Lama in his book, *The Universe in a*

Single Atom. His Holiness also points out the importance of remembering that science does not exist in isolation: "Just as one's fingers can function only in relation to the palm, so scientists must remain aware of their connection to the society at large" (Lama, 2005, p. 11). Because of his openness to the knowledge gained by Western science, I believe he demonstrates a path forward to the scientific community as it moves toward the paradigmatic change that is required if we are ever able to reconcile not only Chalmers' "hard problem," but those other 'white elephants' that science has carefully side-stepped over the last century (many of which are mentioned in the section entitled, *Off Limits*).

The importance of this section, therefore, is to gain insight from an Eastern philosophical perspective. More and more, I have been hearing that science is proving what the yogis and gurus have known for millennia (as if science is somehow playing an important role in their validation). So I knew this step would be an important one in my personal education regarding views that, until recently, were quite unknown to me. I have also noted that several of the Western scientists, philosophers, and Christians I mention in this dissertation were influenced by Eastern thought, including (but not limited to) Saint Augustine (Brown, 2000), Bohr (Honner, 1982), Schrödinger (1992), Bohm (Bohm, 1980; Krishnamurti & Bohm, 1986), Mitchell (2008), Capra (2000), Heisenberg (Capra, 1989), Russell (2004), Radin (Robison, 2012b), and Haramein (Jensen, 2011). So I consider myself in very good company.

In order to initiate myself into the ways of the Eastern traditions, I have selected the Buddhist teachings of His Holiness, the Dalai Lama. Because of his interest in Western science, he communicates ideas and challenges in a language that is familiar to me. For example, I am especially intrigued by his description of the Buddhist approach to enquiry: "when it comes to validating the truth of a claim, Buddhism accords greatest authority to experience, with reason second and scripture last" (Lama, 2005, p. 24). Several thoughts come to mind when I contemplate this statement. For instance,

contrary to the modern Western reluctance to classify first-hand accounts as scientific, it places the subjective experience ahead of all else. It also avoids the 'blind faith' argument that I had grown up with by placing reason above scripture. Furthermore, by recognizing reason as an authority, it invites acceptance of scientific discoveries from the West. Finally, it does not restrict Buddhist investigation to the realm of the physical, since much is to be gained through "introspective examination of inner experience" (p. 24). I am so moved by these ideas that I get the distinct feeling I am moving closer to resolving the science-spirit dilemma.

In addition, I discover what the Dalai Lama identifies as some of the similarities between Buddhism (originating circa 400 B.C.E.) and Western science with respect to reality and role of the conscious observer. On one end of the spectrum are the Buddhist *realists*, for whom there exists a material world made up of an objective reality separate from the mind (Lama, 2005, p. 63), not unlike the Cartesian, dualist view in which the mind is separate from the body. Somewhere in between are Buddhists practising the "Middle Way," which is "held in the highest esteem by the Tibetan tradition" (p. 63). They recognize a co-dependent relationship between the observer and the observed, similar to the quantum model in which there is no independent, objective observer. This nature of reality is referred to as "dependent origination," where relationships are causal, their parts are inextricably linked to their wholes (similar to Wilber's holarchy), and all things only exist in relation to everything else (p. 64). Finally, on the other end of the spectrum are the Buddhist *idealists*, who believe that the only reality is an internal one experienced through the mind. I can find no counterpart in the physical sciences for this group, however, due to an unwillingness of modern science to acknowledge or endorse subjective experiences on the grounds that they are unquantifiable.

From his book, I am beginning to see why His Holiness, a Buddhist practicing the Middle Way, remarks that Nagarjuna's two thousand year-old teachings appear to be echoed by developments in Western physics (Lama, 2005, p. 51). Consequently, I find it

difficult not to romanticize about how the two might intersect at some point in the future, as Radin suggests. Not surprisingly, I am in agreement with the Dalai Lama's comprehensive and compelling argument against scientific materialism:

> this view would uphold that psychology can be reduced to biology, biology to chemistry, and chemistry to physics. [...] The view that all aspects of reality can be reduced to matter and to its various particles is, to my mind, as much a metaphysical position as a view that an organizing intelligence created and controls reality. [...] In this view many dimensions of the full reality of what it is to be human – art, ethics, spirituality, goodness, beauty, and above all consciousness – either are reduced to the chemical reactions of firing neurons or are seen as a matter of purely imaginary constructs. (Lama, 2005, pp. 12-13)

This observation exemplifies what I believe is one of the greatest weaknesses of the Newtonian worldview. It also reminds me of de Quincey's quip mentioned in the introduction. However, I would reword his quote slightly to read, "scientists who believe all can be explained in the *physical* have no awareness that this belief is *metaphysical.*" These new insights lead me to conclude that, if the ideas expressed above are indeed the Achilles Heel of modern science, the way ahead seems straightforward: the new, scientific paradigm must accept and address the subjective, nonphysical experience.

In the Dalai Lama's view, there is a wonderful opportunity for contemplative traditions like Buddhism to contribute to the Western sciences, should they choose to embrace alternative methods to enhance their research (Lama, 2005, p. 160). In particular, they would benefit greatly from the rich, Buddhist studies of the mind, which have been "primarily derived from empirical observations grounded in phenomenology of experience" (p. 135). And since scientists are progressing with studies of consciousness, he contends that due diligence is in order: "Given that one of the primary characteristics of consciousness is its subjective and experiential nature, any systematic study of it must adopt a method that will give access to the dimensions of subjectivity and experience" (p. 134). This is perfectly logical and yet most of the brain-based

research does not entertain the possibility. It is still seeking to provide a third-person account of a first-person experience.

When I consider what can be gained from the Dalai Lama's wisdom with respect to my research, the conclusions are powerful. First, as I formulate my hypotheses about the realms beyond the physical, Eastern traditions like Buddhism have much to offer. Second, although many of my ideas might seem inconceivable to Western scientists, it is possible they might be embraced by Eastern thinkers. Third, my deep desire to reunite science and spirit could be said to align with the Eastern conception of a mutually-inclusive science. Last but not least, should I wish to expand my worldview in a way that exposes me to ideas held by the majority of the world's population, I might start by exploring the foreign, yet-to-be-discovered teachings of the East. And so, with these inspiring insights in hand, I now turn my attention to the real work, my study.

Chapter 3.

Methodology

"You can act to change and control your life;
and the procedure, the process is its own reward."
~ Amelia Earhart (Quotes by Amelia Earhart. [n.d.])

The Road Less Travelled

In this chapter, I describe the steps I have taken to produce this dissertation. I've already alluded to my pragmatic side, as well as my disposition to organize, analyze, and synthesize. So now let me explain why a left-brained, logical individual like myself has chosen to create a project that involves sharing such unquantifiable details as personal stories. I shall begin by borrowing the words of Spencer, "What knowledge is of most worth?" In my mind, this question asks whether there is more value in conducting an academic inquiry into the use of controversy as a teaching tool, or in making sense of the state of disillusionment in which I find myself. Based on the circumstances surrounding me in 2009 when I begin this study, the answer is simple. It seems far more important to face the dilemmas of my inner world than to be driven by demands or pressures of the outer one.

As soon as this selection is made, the methodology becomes clear. There is only a short list of qualitative research methods that embrace self-study as a principal focus, which I narrow down to *narrative enquiry*, *autobiographical enquiry*, and *autoethnography*. Originally I select autoethnography (described in the next section entitled, *Choosing the Methodology*), but this later evolves into an autobiographical

narrative enquiry once it becomes apparent that circumstances demand it (described in the section entitled, *Evolving the Methodology*, on page 97). This alteration of course happens because I am taking an action-research, *enquiry* approach to the study, which allows me to be guided by the twists and turns that present themselves along the way.

The first of these turns takes place the moment I decide to abandon the original research project regarding controversy as a teaching tool. Since I'd already gone through the rigours of obtaining ethics approval and collecting all the data, it is with a great deal of hesitation, reflection, and some regret that I find myself changing tracks. For at this point, it means that I need to start again from the beginning and re-envision how to approach the new thesis, *How did I end up here?* It also requires that I put myself at the centre of the research in order to arrive at some answers to this question. In other words, I must call on my abilities of reflection and self-examination.

Initially, I have reservations about producing a doctoral thesis whose content and communication style I perceive to be so 'non-academic'; and with good reason too. For there was a time in the not-too-distant past when teachers' stories were "rejected in scholarly discourse" (Clandinin and Connelly, 1990, p 242). Much of the academic community took a "technical rationalist" stance toward narratives, dismissing practical knowledge as non-scientific. And as Grumet (1987) points out, the telling of one's life story is personally crafted, so there is no way to know to what degree it represents the original experience. Consequently, if it cannot be subjected to the rigours of scientific evidence, its use as a research tool could be viewed as limited, if not lacking. Initially, this was one of my fears too. I worried that my work would be dismissed if it did not include facts and figures to back up my firsthand accounts. Over time, however, my commitment to telling my personal story eclipses any hesitation I have about whether my dissertation will be considered academically rigorous or not.

I have therefore taken the risk of stepping into the unknown to create a project guided by intuition, orchestrated by events as they occur in real time and told in the first

person. The result of that process is the journey documented here, where I address the very dilemma that lays before me – why I feel so lost when it comes to teaching in the school system. Once resolved, I move on to the challenge of explaining my experiences of disillusionment and subsequent expansion in awareness in terms of science. This leads me to the ultimate question: Might this pursuit somehow lead me to a place where science and spirit meet? While the results of this journey are described in subsequent chapters, what follows is the outline that guided them.

Choosing the Methodology

Originally, when I set out to select one of the three possible methodologies, it is unclear whether I should be conducting a narrative enquiry (Connelly & Clandinin, 1988; Clandinin & Connelly, 1990; Clandinin, Pushor & Orr, 2007), an autobiographical enquiry (Loughran, Hamilton, LaBoskey & Russell, 2004) or an autoethnography (Ellis, 1999; Roth, 2005), since all three share common elements that look like they might pertain to my study. One thing is certain – I plan to include personal life experiences, a personal commentary on those experiences as I work through them, and the outside voices that propel me into places I would never go by myself. So, to learn more about the potential of each methodology, a review of the literature is in order. Below I briefly highlight each of my discoveries and the features I take into account before choosing the one with the best fit.

In the case of narrative enquiry, I am invited to reflect on and make sense of past experiences. Connelly and Clandinin (1988) relate that in "the making of meaning from personal experience via a process of reflection [...] storytelling is the key element" (p. 16). I am instantly drawn to these notions of meaning making and storytelling. In fact, my husband says I missed my calling as a storyteller and affectionately refers to my style of teaching as 'edu-taining.' Not surprisingly, this method of enquiry is increasingly being employed in education, which Clandinin & Connelly (1990) attribute to the fact that

"humans are storytelling organisms who, individually and socially, lead storied lives" (p. 2). Storytelling comes naturally to many educators, and for this reason, teachers and teacher educators find it especially appealing when selecting a methodology, myself included.

But, narrative enquiry is more than just storytelling. Clandinin, Pushor and Orr (2007) emphasize that this approach possesses particular complexities, and urge anyone who employs it to move beyond *telling stories* to conducting *inquiry into stories* (p. 33). To achieve this, "teachers need to become learners of themselves and start to ask questions of themselves" (Kanu & Glor, 2006, p.110). Inspired by this advice as I put together the plans for my research proposal, I make sure to include it as one of my primary goals. Clandinin et al (2007) add that if my research focuses on conceptualizations that I create as I retell and relive my experiences, the process will possess a certain level of "wakefulness" (p. 21). Amazingly, the term wakefulness echoes the notion of awareness that emerges as one of my principal points of enquiry, which appears to confirm that this is the methodology I should employ. Nevertheless, I am still unsure about how it differs from the other two, and thus continue with my review.

While closely related to narrative enquiry, autobiographical enquiry can be distinguished by its reflexive nature. Specifically, it "focuses on narratives that are autobiographical in nature as a way for educators to get at the roots of their own assumptions and deep-seated beliefs about teaching and learning" (Loughran, Hamilton, LaBoskey & Russell, 2004, p. 607). I am grateful for this distinction regarding reflexivity, as it reveals the false assumption I projected onto narrative enquiry – that *I* am the subject of the enquiry. Naïvely, I was reading that literature from the perspective of a first-person narrative and therefore was unaware that I had mistakenly injected myself into places I didn't belong. Now that I have a more complete understanding, it appears as though this might be a more appropriate methodology to choose, as the term "auto," connoting *self*, implies.

Furthermore, in addition to the benefits that might be gained from conducting a narrative enquiry, Bruner (2001) believes that the act of constructing an autobiography will result in a significant personal experience for me as its author. For example, the language I choose in the description of my personal events, will play an important role in the creation of what he calls an "essential self." This will influence not only how I ultimately portray my experiences, but will also have an impact on the sense that the reader develops about *who I am* as a person.

The final methodology to weigh in is autoethnography. At first, I do not even consider it because it introduces an element that does not exist in my original research plan: *culture*. Nonetheless, it is recommended to me by my senior advisor, David, during a discussion we have regarding my research proposal. As part of a demonstration in which I show him how I plan to incorporate personal stories, I share an anecdote about writing up *chem labs* in university (entitled, *Surviving First-Year Chemistry,* found in Appendix B). Immediately, he recalls a similar dilemma, recounting many of the same thoughts and feelings. "It sounds like you should consider autoethnography," he replies. Based on how quickly he is able to respond to hearing my story, he suggests that I investigate others' reactions as well. "There might be something to be gained by knowing if these types of events are unique to you or experienced by the larger community," he advises.

Instantly, my creative mind gets to work. I begin planning how I will gather people together to share my stories, then ask for their reactions. Inspired by the excitement of involving others while also sharing details of my own life, I decide to select autoethnography as my methodology and therefore incorporate it into my proposal:

> Through the process of auto-ethnography, I plan to embark on a journey of self study that investigates how I interpret and explain my experiences in the school system. [...] To complement this reflective process, I shall include the outside voices of 'critical friends' and literature in an effort to

> contextualize my experiences and hold them up to scrutiny. The purpose of this step is to lend objectivity to the research thereby increasing its potential to relate with a wider audience. (Teed, 2011, p. 1)

With respect to this methodology, Breuer and Roth (2005) caution that although "researchers constitute their own object of research so that the knowing subject and the research object become one. Autoethnography concerns knowledge of the self, which is not easily constructed" (p. 109). In response, Ellis (1999), a leader in the field of autoethnography, offers a strategy she calls "systematic sociological introspection and emotional recall" (p. 671), in which one documents the moment-to-moment events that make up one's life as well as the efforts one takes to make sense of these moments. Between my awareness of potential pitfalls and the suggested steps to overcome them, I feel confident that this is the most appropriate methodology for my research. Besides, it also seems to embrace, and perhaps even envelop, the methods of autobiographical and narrative enquiry, in addition to integrating the cultural component, which David and I determine will greatly enhance my study.

Mapping the Journey

Above, I describe the methodology – the philosophical framework behind the autoethnographical approach I originally take toward my research. Now, I explain the methods and procedures I shall carry out. Certainly, the first and most important step is to articulate the question to which I will dedicate all of my time and energy, *How did I end up here?* But where exactly is "*here*"? Quite simply, *here* signifies the state of disillusionment, or *ungroundedness*, that befalls me when I am confronted by the three profound occurrences I mention in the Introduction (that science and religion might have shared a common goal, i.e., the search for *Truth*; I say goodbye to my beloved dog, Einstein; and, a close family member experiences a traumatic event). In terms of time, "here" actually occurs in the fall of 2008. So, while this question appears to *introduce* my study, in reality, it points backward in time. For me, the true beginning to my enquiry, or

at least where it really takes off, happens later, ***after*** I answer this question when I begin to think deeply about the role that consciousness might play in my journey, along with how I might push the boundaries of the western, materialist, scientific paradigm by reuniting science and spirituality. But I'm getting ahead of myself. Let's return to the immediate steps I take initially to arrive at my answer.

When I come up with the idea of using the metaphor of a map to guide my process (described in the Introduction) and to re-orient myself, I have completed the easy part. It takes a little more thought to determine how to document a journey that started at the age of 18 and still continues today, 3 decades later. As a place to start, I settle on the first criterion: to determine the size and scope of the map by defining *which journey* I shall analyze. Therefore, since my confusion appears to be related to education, I decide to restrict my study to the path I took through the school system to see where it might lead.

Instinctively, I also know that the magnitude of the turning points needs to be fairly profound, akin to standing at the crossroads of a life-changing moment and deciding which way to proceed. Since the whole point of retracing my steps is to get clarity, it is easy to see that I might risk getting lost in the minutia if the intersections are not poignant enough. So, for me to be clear about whether or not an event would qualify, the second criterion I choose is to pose the question: Was there a significant alteration to the life path I was on before the event? Only when the answer is a decisive 'Yes' do I count the event.

With these guidelines, I find the process surprisingly simple, and the information flows quickly onto the journal pages. Within a short period, I am able to describe the details of ten turning points (significant life alterations), as well as put together the corresponding map (illustrated in *Mapping the Journey* on page xii), which provides a much clearer picture of my journey. In Chapter 4, I share one of these journal entries to illustrate the process described above. Furthermore, should you care to retrace my

footsteps and conduct your own analysis of the significant events along my path, the complete version of all ten accounts may be found in Appendix B.

With such rich data sitting before me, a multitude of questions surge through my brain. As I reread the journal entries seeking a global perspective, I am able to organize the learnings and insights I gain into a comprehensive chart (detailed in Chapter 4), which in turn allows me to locate threads and themes that weave through them. Ultimately, creating this table is a crucial step, since it helps me to arrive at a definition for "critical events" as well as establish the progression of steps that characterize each of these pivotal moments. Overall, the process is organic and propels me toward two goals: to make meaning of my journey into (and ideally out of) disillusionment, and later, to understand this journey through the lenses of science and spirit.

Slowly but surely, this self-directed enquiry allows me to achieve the first goal by leading me to a place of understanding, or at least acceptance. The answers to my questions become clearer, eventually illuminating what I describe as the *hidden nature* of the school system. Astonishingly, this allows me to have closure to the quandary, *How did I end up here?,* which has eluded me for more than a year. Somehow, by following this intuitive, organic procedure, I am able to resolve my inner crisis and find comfort knowing that the fog has finally lifted. In the next chapter, I share the details of this experience, the revelations I receive regarding what to do next, and how this self-examination, autoethnographic process grows into one of the most significant turning points of my journey to date.

Sharing My Critical Events

Once I move from *auto* (self) to *ethno* (participants in the study), there are a number of considerations to take into account. That is, I need to select the participants, determine the nature of our exchanges, and communicate the intent of the project

effectively. Since it is clear I have no interest in conducting a large, nameless, faceless study, I contemplate the criteria I should use for the selection process. Age? Gender? Experience? Number of participants? In the end, I choose 10 people (4 males and 6 females) aged 30 to 65 who have some form of teaching experience, either formally or informally. I refer to this group as *critical friends* – colleagues and peers whose opinions I respect that will challenge my thinking and make me accountable.

Regarding our exchanges, I plan to model them after the one I had with David in which I share a story and ask a series of questions afterward – a one-on-one interview so to speak. There is only one minor logistical issue: most of my participants live some distance away. As a solution, I decide to challenge myself – to *tell* the stories in a video, post them to the Net, create online forms for immediate feedback, and carry out follow-up calls over Skype, a voice-over Internet protocol (voIP).

In case you may be wondering how *critical events* becomes the term I eventually use in my study, it originates from my hesitation to employ a term like *turning points* because of its use in everyday language. I could also use the term, "critical incidents," found in much of the education literature (Bruster & Peterson, 2013; Russell & Munby, 1992; Shapira-Lishchinsky, 2011). But I opt not to for several reasons. First of all, the word *incident* can connote a tone of lower importance: "something dependent on or subordinate to something else of greater or principal importance" ("incident," n.d.); or be interpreted as negative in nature: "an action likely to lead to grave consequences" ("incident," n.d.). In the context of education, it usually involves the presence of one or more educators who observe and/or assess the incident. Instead, I want the term to be personal and one that does not involve 3rd-person accounts or observations. Most importantly, individuals get to select which events are *their* critical events. For these reasons, I decide to rename those significant moments *critical events*, based on the Greek origin of critical, "*kritikos* – able to discern or judge" ("kritikos," n.d.), hoping that

people will need to rely on my definition for understanding instead of making their own assumptions.

With my participants confirmed, I send out the initial email detailing the study (see *Second Email* in Appendix C). In it, I explain that the research will include two rounds of interviews. Each round consists of several steps. To begin, individuals shall choose a video based on the instructions, "pick any one of the stories you feel drawn to" from the following five options:

- **Jonah and the Whale**: In this reflection, I recall that fateful day when I learned the difference between *literal* and *figurative* in Grade 12 religion class. I was attending a Catholic high school and quickly discovered how naïve I really was.
- **Surviving First-Year Chemistry**: As a first-year university student studying sciences, I quickly learned the importance of *regurgitating* in this ethical dilemma.
- **Learning About Evolution**: As a practicing Catholic who never believed in evolution, I was confronted with the question: Can I continue in the sciences if I don't support this belief? during my first year of university.
- **Getting into Education**: In the '80s, getting into education in Ontario was harder than getting into law school or med school. I suppose it was sheer tenacity and perseverance that earned me a spot at U of S in Saskatoon.
- **"I support a student's right to fail":** When a fellow teacher first spoke the words, "I support a student's right to fail," I was sure I heard wrong. But I have come to understand the significance and importance of this statement.

Once they contact me with their selection, we arrange a date to meet, at which time I send them an email containing a link to the video so that they can begin the process.

At the specified date and time, critical friends view the video. Then they fill out an associated, online form (see *Initial Interview [Online Form]* in Appendix C), which documents their immediate reactions to the story I have shared. Next, they click *Submit*, and within seconds, thanks to high-speed Internet I receive an email with their responses indicating that they have completed the process. This is my cue to initiate the

Skype call. I must point out that for the interviews I conduct in person, I opt not to be present at the time individuals watch the video, nor when they respond to my questionnaire. Because I am seeking their authentic reactions, I do not want my presence to distract or influence them in any way.

During our conversations, we review the content of their surveys, which allows me to ask questions for clarification. This is followed by two extension questions, which are not included in the online survey because I want to discuss them in real time. I do this for a couple of reasons: I want to keep the survey as short as possible; and I want to limit the amount of energy given to them due to their open-ended nature. These meetings are recorded digitally, whether they are conducted in person or remotely, and then transcribed at a later date. Of course, participants are advised in all cases that their involvement is entirely voluntary, so they can decline or withdraw at any point (see *First Email* in Appendix C for details). As you read Chapter 5, you'll be able to follow the progression of one of these examples as well as discover the important insight I gain about communication during this process.

Stopping to Smell the Castanedan Roses

During the course of my research, my husband, who has been following my project's progress from the sidelines, states, "I found something I think you'll be very interested in." He then proceeds to show me the following passage:

> This book is a collection of the memorable events in my life. Don Juan revealed to me as time went by that the shamans of ancient Mexico had conceived of this collection of memorable events as a bona-fide device to stir caches of energy that exist within the self. They explained these caches as being composed of energy that originates in the body itself and becomes displaced, pushed out of reach by the circumstances of our daily lives. (Castaneda, 1999, p. 3)

In the moments that follow, I have a few thoughts. First, I am excited. I feel as though Castaneda is telling me that, not only is my project worthwhile, but that collecting memorable (read "critical") events is a process carried out by the shamans in ancient Mexico since time immemorial. My next reaction is to hear the voice in my head say, "Not again! Here you go thinking you might have an original idea only to discover that you've stolen it from a book that was written 14 years ago."

Because I have been taking an enquiry approach to my research, I allow myself to be responsive to this discovery. The first pages of Castaneda's book resonate so strongly with what I am doing that I decide to modify my plans for the second round of interviews. What I have neglected to mention in the preceding section was the caveat I included in my second email to participants:

> With your permission, we will repeat the steps above. However, in the meantime, I will be reading a book that may influence some changes in the procedure. I am not sure what those changes will be because I have not yet read the book. (*Second Email* sent to participants in Appendix C)

And with that, I read *The Active Side of Infinity* (Castaneda, 1999).

So what does the book inspire? Without retelling too much, I am prompted by the practice of the old sorcerers' technique of recapitulation – "recounting the events of your life" (Castaneda, 1999, p. 71) – to ask my participants to share their own critical events. Having conducted a personal analysis regarding the nature of these events myself, I am able to generate a list of questions that will hopefully provide insight into others' experiences of them. Consequently, I send a second email request, which asks them to consider the following:

My request is for you to select an event that you are comfortable sharing by answering the following questions:

- What were the circumstances surrounding your critical event? (Please include your age at the time and any other information that is relevant to understanding this event.)

- What changes in yourself did you notice during and/or after the event? emotionally, physically, other...
- How were your values/beliefs altered by this event?
- How did this event change your view about yourself, your life, your relationships, etc.?
- What have been the long-term effects of this event? How has this event contributed to the person you have become?
- What did you learn as a result of this event? If there was a lesson to be learned by this event, what might it be?
- What emotions are stirred up for you as you recall this event?

We then meet at the mutually agreed-upon time, either in person or virtually using Skype, and I listen and digitally record their responses to my questions, which I later transcribe.

According to the ethics standards I committed to carrying out, once again I make certain to inform everyone that whether they choose to answer the above questions or not is entirely voluntary and if they do not feel comfortable doing so, they can certainly decline. Alternatively, they can repeat the process we did for round one.

Changing Direction: Take Two

When I originally ask people about their reactions to my critical events, my aim is to find out if there is any universality that can be found among them. Then by reading Castaneda I am moved to ask them to share their own. Yet, while I love engaging with each of my critical friends in real time (in person or online), I find analyzing the experiences after they've happened to be far less invigorating. On one hand, there is hope that through this process, I might discover themes which will point toward the next best theory about the human experience. On the other, there appears to be a growing number of indicators that my current methodology is simply not working.

The first and most obvious indicator that I am going down the wrong path is my distaste for *coding*. Coding is the technique I initially use to organize the data from the

transcripts of all of the interviews and conversations I conducted. It is a task that involves reading, rereading and highlighting content that reflects key concepts. Along the way, you also make notes, look for emergent themes, review your codes, and find interconnections between them, among other fairly complex, iterative procedures (Gibbs, Clarke, Taylor, Silver, & Lewins, n.d.). I find it so tedious and uninspiring that I can feel myself losing interest in the project.

What I particularly dislike is trying to capture and represent the stories of critical friends in words or phrases that possess only faint hints of the original joie de vivre and magic with which they were shared. I am reminded of the reductionist mindset in modern science that urges us to break things apart in order to better comprehend them. Through the process of coding, we 'reduce' our experiences with the intent to illuminate some yet unidentified relationship between component parts. As I think about this, I find it fascinating that my experiences of the coding process are not nearly as rewarding as originally thought. I am cognizant of the fact that I chose this technique because it appealed to my left brain, yet now it is my right brain who is expressing her inability and unwillingness to code the life of another human being.

A second challenge I have with the process thus far deals with telling others' stories. It is a concept I have come to more fully understand from my friends with Indigenous heritage. Since oral traditions pervade most First Nations cultures, many of their stories reflect intimate details of their lives. In terms of propagating living records of people and events, this is an important aspect of storytelling, as "it allows storytellers to use their own voices and tell their own stories on their own terms" (Qwul'sih'yah'maht, 2005, p. 242). Similarly, stories may be considered personal or clan possessions, as is evident in Tlingit and other Northwest Coast oral traditions:

> A given story typically explains how the progenitors of a particular clan acquired certain spirits and therefore have the exclusive right not only to tell the story and perform the related songs and dances, but also to depict

> and use them as clan crests in the form of visual art.
> (Dauenhauer & Dauenhauer, 1998, p. 60)

By learning about these Indigenous ways, I am able to see why it would be considered inappropriate to step into someone else's shoes, so to speak, and offer your own account of their experiences. When we truly honour the uniqueness of an individual, we are able to see how sharing a story that is not your own can be considered inauthentic, since the lenses through which it is viewed do not belong to the one having the experience. Of course there are ways around this: for example, using quotations, and having participants verify and approve what is written that they have shared. Regardless, this does not appeal to me. I recognize that I am most interested and intrigued with exploring *my own* stories; a realization which incidentally offers me some insight into an Indigenous perspective of ***own***-ership. For the reasons expressed in this paragraph, no accounts of critical events belonging to anyone other than myself appear in this dissertation.

A third reason for my feelings of turmoil arises as a result of not being entirely honest with myself about involving critical friends in the first place. I realize now that I avoided acknowledging my fear of conducting a study that might be regarded as non-scientific. In my mind, calling upon the input of critical friends would legitimize or give credence to my results. That is not to say that I don't consider this a valid reason for their inclusion, especially since I decide to look at the topic of subjectivity later. But I eventually find that this rationale is more burdensome than liberating.

Additionally, I feel that to do justice to the ethnographic component of my research as it was outlined in my proposal, I would need to be perpetually looking back at my critical events which are firmly rooted in the past. This, in turn, would restrict me from incorporating any noteworthy developments along my life's path that take place *after* the fall of 2008. Because of my commitment to making the journey as meaningful

as possible, I am unable to keep myself chained to a backward-looking thesis. I therefore determine that I will keep open to future potentialities.

As a final point of contention, I come to realize that there is still something missing from my study – something about the science, about my *love* of science that is not appearing anywhere in the research. When I switched topics from controversy to mapping my journey, I hadn't realized that this key element was lost. Then one hot summer day travelling home from a holiday, as I am scribbling notes in my journal, it comes to me. For my study to survive, I need to pause and reassess: What do I hope to gain from this whole experience? Since the driving force behind completing this dissertation has always been the enjoyment I get from the process, I know that I will need to find *meaning* in what I am doing.

So I deliberate. How can I make the project more meaningful? Intuitively, I know it has something to do with incorporating science, but how? Then my rebellious self pipes up. She never fully bought into the science we were taught in school. It is she who decides that I need to examine my *critical event* research through a scientific lens; and not just traditional lenses, but those of cutting-edge science, or as some say, more contentious, *fringe* theories as well. The inner dialogue continues and ideas proliferate, until I arrive at the following thought: If critical events impact one's life so profoundly, why not push the boundary to see if this line of thinking might lead to a place where science and spirit intersect!

With this unexpected change in direction, once again I find myself in the familiar position of having to determine the new scope of the study. After a great deal of deliberation, I choose to investigate this question: *Can critical events expand awareness (and/or consciousness)?* Instantly, I feel my excitement for the project return as I contemplate the possibility of incorporating science and perhaps even spirituality into my research. Please note that you will often see *awareness* closely followed by *consciousness* in the remainder of this dissertation. This is due to the fact that many of

the researchers use the two interchangeably. I, too, have decided to follow this convention.

What Does the Science Say?

In order to propose links between critical events and expanded awareness, I set my sights on the daunting task of reviewing all relevant research. However, when I discover that the science of consciousness is a relatively new area of exploration (only three decades old), I am hopeful that it will not be too vast an undertaking to get a sense of what modern knowledge on the topic has been assembled thus far. I quickly learn that scientists have taken their research in a multitude of different directions, thereby adding many layers of complexity. So for a novice like myself trying to locate unified themes, it turns out the task is more than overwhelming. Besides, I am not exactly sure what I am looking for. I know I won't open up journal articles and read "How critical events lead to expanded awareness" in the abstracts. But upon what exactly do I expect to stumble? I decide to consider any sources that look remotely connected to my topic, then focus only on those which provide scientific explanations that link directly to my findings.

On the whole, the results are astounding. Studies on consciousness have been going on around me despite the fact I've never heard a whisper. What I find most fascinating, not to mention extremely encouraging, are the assertions made by members of the science community that sound a lot like *spiritual discourse*. This newly-discovered body of research not only helps to frame how I might explain consciousness through critical events, it also inspires me to consider going back to my participants one last time to see if I can find any links between their experiences and the theories. But how might I do this with so many perspectives on consciousness being investigated by so many of the different science disciplines?

To initiate this complex task, I organize the literature that relates to my hypothesis into two categories: **modern science** – sources based on the traditional principles of objectivity and the physical universe; and, what I call **21st Century science** – sources that incorporate the scientific method (as does modern science), but apply it to non-traditional topics, e.g., alternate realities, the paranormal, time travel, etc., as well. I anticipate that any of the research I discover will clearly fall under one of these two headings. From there, I hope to see if there are themes that emerge which might characterize each of the groups and perhaps point me toward some enlightening conclusions.

Putting the Puzzle Together

Despite the wide range of approaches to consciousness, I start to see the pieces slowly come together. In some cases, I find it necessary to restrict scientific explanations to those gaining the most momentum since there is so much to sort through. In others, there are sources that can be easily grouped with articles of a similar nature, which allows me to strengthen certain arguments and guarantee their inclusion. In the end, it all comes down to how well the research supports my burgeoning hypothesis, *that critical events are opportunities for expanded consciousness.*

Yet it suddenly occurs to me that while I am restricting myself to science, there are two other bodies of knowledge with a much longer history, which might be able to offer wisdom into my enquiry on consciousness. So I decide it is time to expand my list of categories and add: **ancient wisdom** – sources which include the millennia-old, Eastern traditions, e.g., Buddhism, Hinduism, etc.; and **Indigenous science** – sources which acknowledge the Indigenous peoples' ways of seeing the world. Alas, the moment I do this, I feel as though I have found the missing piece to my puzzle – the link to spirituality that I was longing for intuitively.

Next I realize that insight from some critical friends can also help shed light on the topic. Therefore, in an effort to seek out my own conclusions related to consciousness, I email the following list of questions to participants for feedback:

- Was your critical event thrust upon you or did you initiate the event intentionally?
- Please finish the sentence if you feel it applies:
  As a result of my critical event, I developed an expanded awareness about _____. ('expanded awareness': anything that you had not been previously aware of OR your awareness of something grew)
- If you experienced an expansion in awareness, did this happen **before**, **during** or **after** our meeting?
- Would it be fair to say you were a new person because of this critical event?
- Did this event inspire you to search for answers? If so, to what questions?
- Would you say you had any type of extra-sensory or paranormal experiences associated with the event? (for example: gut feelings also known as precognition, telepathy, clairvoyance, etc.) If so, please describe briefly (if you feel comfortable).
- Do you think there are different levels of consciousness among people?
  If so, did your critical event contribute to an expansion in your level of consciousness?
- Did you reflect back on the critical event to any significant degree before you participated in my research? Would you say self-reflection is something you do regularly, sometimes, or never?

Since this is an unexpected development late in the project, I do not want to inconvenience people. As a result, you will notice that the majority of the questions are close-ended. In other words, I ask them to select answers, and limit the number of explanations I request. In my mind, this approach will still yield valid results, since I consider each person to be her or his own authority on the critical events. Furthermore, if I ask open-ended questions, it would be up to me to figure out the nature of people's experiences, which is well beyond the scope of both this project and my interest.

Ultimately, I hope to be able to relate participants' and my experiences of critical events to both science research and a few age-old traditions.

Evolving the Methodology

One of the early concerns I have with my study is that it might not be considered *scientific*. Yet I really want to feel as though my thesis contributes to the greater science community. So when I select autoethnography as my methodology and involve critical friends, I feel quite certain I am on the right track. However, it is not until I face the challenges described in *Changing Direction: Take Two* (on page 90) that I am forced to realize I am misaligned with my purpose. Not my thesis' purpose of resolving the question, *How did I end up here?* I am referring to my overall purpose for pursuing a doctorate: the deeper meaning I have been seeking along the way. Somehow, I have allowed direction from the outside world to take precedence over my inner guidance.

However, once I become aware of this dissonance, I confront it. Initially, I do so by acknowledging the importance of changing directions and incorporating my love of science into the mix. This then leads to questions of awareness and consciousness. But now is the moment when I determine that in order to realign myself with my purpose, I must abandon autoethnography as my methodology. That is, I choose to relinquish the ethnographic, or *cultural* component, in favour of a more personalized *autobiographical narrative enquiry*. Although most of the explanations that propel me toward this decision have been presented above, the factor that motivates this final alteration of course is the realization that I am the "conscious observer" of all of these experiences.

One way for me to understand the significance of being a conscious observer from a methodological perspective is to examine my process as it has unfolded. Therefore, I must step back and contemplate the events that have taken place in order to fully appreciate the role this inner guidance has been playing. In retrospect, I am able

to see that I begin each leg of my journey with an **intention**, that is, a choice of action, which is usually informed by logic. I then follow this intention to carry out my plan. However, at some point along the way, my **intuition** informs me that where I am headed is not where I would like to go. This creates cognitive dissonance, or what some might call an *existential crisis*, which compels me to stop what I am doing altogether. At these times, the project may come to a complete halt, or it may just stall for a short period. In either case, I eventually take the opportunity to reflect. Through **reflection**, I am able to gain some perspective about my current situation. Then slowly but surely, I find a way forward, which incidentally is usually informed by logic.

In an effort to further deconstruct the steps of my method, I note my use of the terms *intention*, *intuition*, and *reflection*. I highlight these words because to me, they signify the inner, contemplative processes I rely on to maintain the forward momentum of my project. I notice that I am able to categorize them into two groups: activities of 'brain' and 'no brain.' For example, I'm certain that materialist scientists will agree that setting an intention and reflecting on the outcomes are both acts performed by the brain. Yet I'm equally as confident that there are researchers, like Radin and Schlitz (2005), who would infer that intuition takes place *beyond* the brain.

When I look to the literature for insight, I discover Henri Poincaré's (1914/2003) assertion, "It is by logic that we prove, but by intuition that we discover" (p. 129). Based on the fact that both logic and intuition are instrumental to my process, this makes me wonder if they might be at cross purposes. Or, might it be just as accurate to say that I am leveraging *both* logical analysis and the subtle faculty of intuition (Palmer, Zajonc, & Scribner, 2010) to carry out my study? I reason that both serve to guide me along my path, but acknowledge that I must look to quantum theory over modern science if I hope to validate the latter.

As I consider what has been potentially lost or gained by my decision to evolve my methodology toward one of a more intimate self-study, I can't help but recall Bohm's

implicate order, Mandelbrot's fractals, and Wilber's holarchy. If it is true that the whole is present in the smallest parts, as these theories suggest, then perhaps in some way, by isolating the microscopic elements of my journey, they might be reflective of what occurs for the greater macroscopic whole. And if not, then hopefully they might hold some archaeological value for future humans trying to figure out what happened to the school system in the early 21st century.

To summarize, in this study, which begins as an *autoethnography* and evolves into an *autobiographical narrative enquiry*, I map the critical events of my life in order to determine how I ended up in a place of disillusionment regarding the school system (Chapter 4). Next, I carry out the cultural, or *ethnographic,* component of the study as I examine the feedback of critical friends to my events as well as ask them to share their own (Chapter 5). After that, I look at the steps of this self-exploration process, the benefits it might have for others, and the knowledge I've acquired regarding possible next steps that might lead us toward a new scientific paradigm (Chapter 6). Finally, I consider how I have been changed by this process and what concluding insights I can offer (Chapter 7).

Chapter 4.

How Did I End Up Here?

"I am still unable, as the Delphic inscription orders, to know myself; and it really seems to me ridiculous to look into other things before I have understood that."
~ Socrates (in Plato's 'Phaedo' [Plato, 360BCE/2002, 230A])

Full Disclosure

Before I explain how I found myself in the state of disequilibrium that inspired this dissertation, I will provide a few background details that highlight the storyline that was my life at the time, beginning with my return to grad school. This will also serve to contextualize the study while acquainting the reader with my biases, especially those related to the school system. By the end of this chapter, I hope to have successfully conveyed not only my solution to the dilemma, *How did I end up here?,* but also to present how an analysis of critical events with respect to my experiences *in* and *with* the school system allows me to arrive at this solution. But for now, let's turn back the clock to the year 2008...

When I began my doctoral coursework, I was fulfilling a need to spend time with people who shared a similar longing for deep exploration. Deep exploration into what? I'm not sure that it even mattered. I just knew that I wanted to connect with individuals like myself who were *searching,* and I thought I just might find them in a doctoral program. I was not disappointed. I found my 'peeps.' And an eclectic cohort we were at that! I dare say that while we all integrated successfully into society, we also possessed

our unique idiosyncrasies that made each moment we spent together extremely enjoyable and entertaining.

As the months flowed along, newfound friends started confessing to the significant life changes they were experiencing – marriage breakups, moves, quitting the program, and more. At first, I listened politely and attributed these upheavals to the 'geek' gene that I assumed we all possessed for dedicating ourselves to the notion of getting a PhD. But it was not long into the first semester that I, too, found myself surrendering to the trance-like, floating state of ungroundedness to which they had succumbed. In the Introduction, I call it the *fog of uncertainty*. Here, I elaborate a bit more about how it felt.

The first symptom I am able to recall was a sense of detachment from my daily routine. I was teaching little people (grade 4) by day and big people (candidate-teachers) by night. Although they did not appear to detect any change in me, I noticed that I was carrying out my tasks in a robotic fashion. For example, when conversing or teaching, I could hear words coming out of my mouth, but eerily I was not the one speaking them. In retrospect, I would say I was in a very profound state of cognitive dissonance. Two factors that I believe contributed significantly to this were the passing of my 13-year old dog and beloved companion, Einstein, and my impending departure from the school in which I was teaching the following spring.

A second symptom of the *fog* was that of physical heaviness, which I felt at particular times, both as a grad student when I discovered things to do with the school system that I found disconcerting or shocking, and, as a teacher when I was experiencing firsthand those disconcerting or shocking things I had just learned. As a result, it became increasingly difficult to go to work and teach 9-year olds in a musty, old portable. To compensate, we spent more and more time outdoors *exploring*. Slowly, I began abandoning the provincial curriculum and prescribed learning outcomes, substituting what I thought to be more important. Secretly, I imagined that the principal

would one day appear on the doorstep of my classroom and accuse me of some *Lord of the Flies* (Golding, 1959) behaviour. And to be honest, I wonder if I would have even cared.

These symptoms were also wreaking havoc on my thesis plans. I felt little to no emotion toward my study on "using controversy as a teaching tool." If anything, I was developing a growing distaste for it and kept my photocopied articles piled up in the back of my closet where I wouldn't have to deal with them. When I was encouraged by professors to write papers that would explore and advance my research topic, I feigned interest and obligingly produced assignments that satisfied them. I maintained this behaviour right up until the end of my last course. However, none of this could unburden me of the inner state of utter disillusionment that I was in.

Then, out of the blue, a little voice inside of me beckoned, "Change your topic." The first time I heard it, I mused romantically about the possibility of creating a website for my thesis instead of a text document, and imagined the looks on the faces of my advisory committee when I informed them. Then the voice spoke again, and the reality of such a proposition started to sink in. "What? Now? After all the work I've done? Seriously?" But the more I sat with the idea, the more drawn to it I became. It was the first time in months I had felt anything more than ambivalence toward my project. And so, slowly I moved from feelings of insanity, to reluctance, to courage, until one day I made *the decision* – I'm going to use this research opportunity as a way to figure out how I became so... *lost*. All of a sudden, my energy returned! This brings me to the current study, the one you find before you, in which I attempt to explain how I ended up *here,* floating in the *fog of uncertainty*.

Motivated by this new direction, I spring into action. I sketch out a plan to apply the metaphor of a map and document the key turning points, or *critical events*, along my journey (described in the last chapter). Next I begin to retrace my steps through the school system. Each time I come across a noteworthy experience and ask myself if there

was a significant alteration to the life path I was on, I surprise myself with the memories and reactions that come rushing forth. What I find particularly interesting in this process is to look at the before and after effects of certain events, then chronicle the surprising observations and assessments that emerge in my journal entries.

In order to give you an example of my procedure, I'd like to share one of those moments here; not only because it will give you a sampling of how my process took place, but also because it is the most popular of the critical events, selected by the majority of participants during the first round of interviews.

> Just like many new teachers, when I first started teaching I had naïve expectations and lofty goals. So when veteran teachers complained about their struggles with students, I would tell myself, "That will not happen to me." I felt quite immune to the negative commentary that occasionally took place in the staff room. There was little they could say that would penetrate my thick layer of positive thinking and blind ambition.
>
> However, one day during a conversation with a colleague whom I greatly respect, he said the oddest thing, "I support a student's right to fail." At first, I thought I hadn't heard him correctly. "A student's right to fail..." I turned the words over curiously in my mind. What could he possibly mean? So I asked for clarification. I wasn't at all prepared for his response.
>
> One thing my colleague claimed was disappearing from the school system was a student's chance to fail. According to him, we were passing kids on even if they didn't possess the skills they needed to move forward. As a result, they were learning that perseverance and effort didn't really matter, and for some this meant trying less and less. "Not to worry," the system had taught them. "You'll be passed on anyway."
>
> "Unfortunately," says he, "students are missing out on a valuable learning opportunity – failure." Then he asked me, "Have you learned more about life, yourself, and your abilities from your successes or your failures?" He made a great point. Originally my 'Susie Sunshine' self wanted to oppose his notion of failing students. Wasn't it the teacher's responsibility to ensure that all students succeed? But with this question, he forced me to consider the importance of not succeeding. "Take a look at all the great failures – Coca-Cola, penicillin, the birth control pill. Not to mention, the power of failure to push people beyond what they believe their limits to be."

> It would be a long time before I would fully grasp the profundity of my colleague's statement. But over time I have come to agree with him. When we don't allow students to fail as well as succeed, they are left in a kind of holding pattern. And if they never confront the potential failure, they will always wonder if they could have overcome it. I know this from personal experience because I was allowed to quit piano when it became too difficult. Only now as an adult do I wonder if I might've become a pianist if my parents didn't let me quit at the first signs of struggle.
>
> My most recent experience that encapsulates this belief happened during my final year of teaching. One of my students had struggled through the separation of his parents. Emotionally, it was difficult to watch him respond by refusing to do school work. Perhaps it would have been more sympathetic to overlook his present performance and assess him according to his past successes. However, my response was to tell him that I supported his right to do nothing, that I would honour his decision and I would not try to force him to do the assignments. And I meant it with the most love and respect. However, he should know that the consequences would likely lead to failing grades. When he decided that the work was worth doing, he proved to himself and to me that he was capable of it. And I can't help but wonder if he also learned that his success in school played an important role in the challenges he was having in his personal life.
>
> (entitled, "*I support a student's right to fail,*" found in Appendix B)

This qualifies as a critical event because it is one of those impressionable moments early in my career when I was exposed to another's beliefs about teaching that were so markedly different from my own. (I never do seem to get over discovering these differences.) In this case, a fellow teacher makes a statement that rocks my foundation so thoroughly, I find myself revisiting it over and over again in both my elementary classroom and my instruction of candidate-teachers. Another aspect that makes the event so momentous was my surreal, almost out-of-body experience of it as a I listened to him. I found myself wondering if he was not truly from another planet. How dare he think that students deserve the right to fail! And hence, it becomes one of the turning points on my metaphorical map.

Upon careful review of the more prominent events that occurred throughout my time in the school system, I repeat the process mentioned above until I return to the

present moment, having successfully completed the self-assigned task. Before me lay ten accounts scribbled in my journal, which seem to sum up the essence of my journey – my map, so to speak. Yet when looking at them, they don't appear to be particularly dependent on one another. That is, while there are several themes that emerge, each turning point comes with its own unique teachings and insights, which I describe in detail in the next section.

More important than describing emergent themes, however, is determining whether or not I am able to answer my burning question, *How did I end up here?* Although my immediate response is not a definitive "yes," I do have some sense that the *fog* is lifting. I know this change can be directly linked to clues hidden in my reflections on these critical events. Intuitively, I feel that their exposure will eventually lead me to a place in which I can find increased comfort with who I have become, and ultimately attain the peace I am seeking. It is as if each of these steps is auspiciously leading me toward the solution of a riddle, so that one day soon, I will indeed figure out *how I ended up here*.

Connecting the Dots

In order to conduct an analysis of my journey, I begin by looking for trends or threads from which I may be able to extrapolate some insight. Earlier, as I was writing about each of the events, I noticed they were simultaneously provoking internal reactions to the discoveries I was making about the school system while increasing my awareness about its invisible nature. But because I was carried along with the flow of emotions, I lacked perspective. Therefore it makes sense to take a step back and organize these reflections into a chart so I can get a birds-eye view of my map (see Table 4.1). Then, with the evidence before me, I might be able to gain some understanding about the possible causes of my demise.

Table 4.1. Critical Events: Learnings, Insights, and Emerging Questions

#	Critical Event Summary	Learnings I Took Away from the Experience at the Time	Insights I Gained Regarding the School System	Emerging Questions
1	I recall that fateful day when I learned the difference between *literal* and *figurative* in Grade 12 religion class. I had been attending a Catholic high school when I discovered how naïve I was.	Parents are our first and most powerful influences. But at some moment in our lives we step into our own identities. Whether or not this is a painful process depends on many things.	Learning that you are different can be publicly humiliating in a school setting.	Is this a necessary step in a person's development? If so, is it appropriate to try to protect or prevent students from having this experience?
2	As a first-year, university student studying sciences, I was faced with the dilemma of cheating as a means of surviving the system.	There was only one way to be successful in this system, and that was not based on what you knew or understood. It was based on how well you could write tests.	Students are forced into ethical dilemmas at school. One wonders to what limits one must go in order to survive the system.	Can one create a 'system' in which these types of ethical dilemmas are avoidable?
3	As a practicing Catholic who never believed in evolution, I was confronted with the question, "Can I continue in the sciences if I don't support this belief?" during my first year of university science.	In order to remain in the sciences, I had to adapt my religious beliefs because science and religion were perceived as mutually exclusive.	Students are often confronted with teachings that conflict with what they are taught at home. This creates a conflict between authority: family vs. school.	How might schools be more open to addressing religious beliefs in the classroom so that students don't experience this conflict?
4	In the eighties, getting into education in Ontario was harder than getting into law school or med school. I suppose it was sheer tenacity and perseverance that earned me a spot at U of S in Saskatoon.	When one is so committed to a goal, they will do anything to make it happen, even if it means moving to foreign land. I believed I was a teacher and I wouldn't let anything stand in my way of becoming one.	Teaching is a calling. No one will ever survive teaching if they think of it as a job.	If the job didn't involve grading/marking, might more people want to be teachers?
5	In my second year as an elementary teacher with a class of thirty-two, 25% of whom required 100% of my attention, I quickly began to wonder if I was suited to teaching.	Teaching in the school system is a job where the odds are stacked against you, and in my case, I was unaware of many of those 'invisible' obstacles.	Teachers can't possibly meet the needs of all students, especially given the constraints of class size, learning disabilities and their own lack of training.	What would a school look like that would satisfy me?

#	Critical Event Summary	Learnings I Took Away from the Experience at the Time	Insights I Gained Regarding the School System	Emerging Questions
6	When a colleague first spoke the words, "I support a student's right to fail," I was sure I heard wrong. But I have come to understand the significance and importance of this statement.	Preventing and protecting students from experiencing consequences is unnatural and does not promote growth. We learn more from our failures than our successes. (Having said that, I no longer believe in grades.)	When students get passed along despite their poor performance, it teaches them that their efforts are irrelevant. Consequently they become complacent in the learning process.	Why do we need grades in the first place? If education is truly meant to prepare us for jobs, why don't employers bother looking at our transcripts?
7	As a mature adult, I learned that I was an auditory learner along with 40% of the population, which might explain why I struggled so much with all of the required reading.	The school system is severely limited in its abilities to accommodate the diverse needs of learners. This can be due to the teacher's lack of knowledge or a myriad of other things.	Students can feel 'stupid' when they do not experience success, especially when others around them do.	What would a classroom look like that meets more students' needs?
8	Watching a thought-provoking movie at exactly the moment I was ready for the topic (metaphysical in nature) changed my perception of science.	The education system does not reflect true science. Instead, it conveys the opinions and perceptions of the ones teaching the science courses.	Teachers who perceive science to be fixed, positivist, materialist, etc. pass on those conceptions to their students and propagate the cycle.	Is this transmission of attitudes and opinions avoidable?
9	In a doctoral course I learned that before the 17th century, science and religion shared a common goal: to learn the Truth.	What I learned in school about science was not entirely accurate. Science and religion were not always mutually exclusive.	The school system propagates a western, Euro-centric, Newtonian view of science.	What if we taught students about worldviews, lenses, biases, etc., not to mention from Eastern and Indigenous perspectives as well?
10	Once I started learning about aspects of the school system of which I had not been aware, I began taking liberties and deviated more and more from the prescribed curriculum.	Because of my audacity, discontent, and what I felt was right for the students, I could justify creating a better curriculum... but this was not what I was hired to do.	Because curriculum is not determined by the individuals who participate in it, it is autocratic, limiting, and aims to prepare students for... well, to complete this phrase is almost impossible.	Why do people keep telling me that I'm the kind of teacher the system needs? What are they really saying?

I choose to set up the chart according to the ten critical events (left-hand column) so that I can view both the learnings I took away from each experience (centre-

left column) and the subsequent insights I gained regarding the school system (centre-right column) as one cohesive set. This allows me to treat each item individually, yet be able to step back and get a more global perspective of the learnings, insights, and emerging questions that result (right-hand column). I am especially keen to see if relating my critical events to the discoveries I make about the school system might lead to some revelations of which I was previously unaware.

Once I review the knowledge gained from this process, it becomes apparent that this intuitively-guided plan can now give rise to an organic definition of a critical event. Thankfully, careful inspection and deliberation of the content in Table 4.1 gives me the ability to do this. I know it will be important for me to come up with clear and concise wording, since I have future plans to invite others to share their critical events (in Chapter 5). After thorough analysis, I am able to capture the essence of my experiences in the following description of a *critical event*:

> ***Critical event***
> - an event which produces a dramatic alteration to one's life path, synonymous with a turning point, characterized by one or more of the following:
>
> - a dramatic change in attitude, emotions or well-being, and/or a dramatic change in health
> - a significant re-evaluation and/or change of values/beliefs
> - a significant change in the person you were before the event (noticeable to yourself and possibly others)
> - or any other profound influences not mentioned but similar to those above

Out of curiosity, I also conduct an Internet search to see if there exists other uses of the term, "critical event." Experience as a teacher has taught me that one's prior knowledge carries great weight, so I want to be particularly attentive to the language that is exchanged in this regard. I come across two interpretations, which I have included here, not only because they provide insight into other ways participants in my

study might construe critical events, but because they might also be considered interesting metaphors for my own definition:

- "any event which has a stressful impact sufficient enough to overwhelm the usually effective coping skills of either an individual or group. They are typically sudden, powerful events which are outside the range of ordinary human experiences and as such can have strong emotional effect even on well trained, experienced people such as firefighters" ("critical event," n.d.a)
- "defined as: Death, Suicide or Serious Physical Injury [...] Serious physical injury is defined as an injury that creates a substantial risk of death or that causes serious permanent disfigurement or protracted loss or impairment of the function of any bodily member or organ" ("critical event," n.d.b)

It would be prudent to mention the sources of these descriptions, since they will assist in contextualizing the meaning. The first is taken from a fire and rescue service website, and is remarkably similar to the qualities I attribute to a critical event. The second definition applies to fatalities described in a child welfare manual. In this case, the term appears to be situation dependent, and therefore falls on the more extreme end of the spectrum with respect to my use of the term. Nonetheless, both versions allow me to have an appreciation for possible alternative conceptions of a critical event.

Next, I set about deconstructing my experiences of each critical event. My intent is to somehow discover how, either individually or collectively, they might have led me to a sense of loss so great that I feel compelled to leave teaching. In particular, I hope to find out if I can explain these influential moments in terms of *increasing awareness* so that I might be able to attribute upward movement or growth to my journey. I suppose, in retrospect, I possess a selfish need to put a positive spin on the whole affair. Consequently, following detailed analysis, I am able to arrive at the following progression that takes place during each of my critical events, which I might also propose has the potential to bring about *transformational learning*, borrowing from Mezirow's lexicon:

Step 1. I am faced with a scenario that created cognitive dissonance.
→ This challenges my existing thoughts and beliefs.

Step 2. I had a need to resolve these feelings of disequilibrium.
→ This causes me discomfort and a sense of insecurity.

Step 3. I took action by choosing an outcome that most resonated with me. → This returns me to a state of balance.

Step 4. I observe that I have experienced an expanded sense of awareness. → I can categorize the new level of awareness into one of the following: human nature, relationships, and the nature of the school system.

In case you are wondering how the notion of *expanded awareness* becomes part of my process, my first thought is to ask you to call on any experience you might have with depression. If it is familiar to you, you'll know that feelings of pointlessness and worthlessness dominate, and any hope of ever exiting this state (at least in my experience) lies in finding a reason to care about something... anything! I reason that if I can find *value* in this experience, which I determine will come in the form of expanded awareness, I might have something worthy of sharing with others, (which coincidentally is the goal of a doctoral thesis). More importantly, I might be able to put an end to the awful state I am in.

Self-Analysis 101

Although it is important to consider the commonalities and themes among critical events to arrive at a definition and hence articulate the progression of steps, to me these are left-brained tasks that I find easy and obvious. Needless to say, they don't further my understanding about my disillusionment, nor do they give meaning to my experiences. As a result, I decide to step back and view the journey as a whole.

Table 4.2. Awakening to the System

#	Critical Event Summary	1. Was this event and the knowledge gained from it a threat to my staying in the school system?	2. How does this event compel me to question the system?	3. By reframing this event as a *challenge* to the school system, could I uncover the system's hidden nature?	4. Could an expansion in awareness inspired by this event be a direct cause for my leaving teaching?	5. How did this event raise my level of awareness about the system?
1	I recall that fateful day when I learned the difference between *literal* and *figurative* in Grade 12 religion class. I was attending a Catholic high school and discovered how naïve I was.	No	I question the nature of learning in a public setting.	No	Not really. I felt this was growth I would have experienced anyway.	I became aware of the public humiliation students experience.
2	As a first-year, university student studying sciences, I was faced with the dilemma of cheating as a means of surviving the system.	Yes	I question a system that makes cheating look like the best solution to survival in it.	Yes: It creates ethical dilemmas.	Absolutely. This is an unwarranted aspect of education.	I became aware of the false interest in learning that the system displayed.
3	As a practicing Catholic who never believed in evolution, I was confronted with the question: Can I continue in the sciences if I don't support this belief? during my first year of university science.	Yes	I question why students must adapt to the system instead of the reverse.	Yes: It presents a question of authority – family vs. school.	Not really. I felt this was growth I would have experienced anyway.	I became aware of the struggle students from different cultures experience.
4	In the eighties, getting into education in Ontario was harder than getting into law school or med school. I suppose it was sheer tenacity and perseverance that earned me a spot at U of S in Saskatoon.	No	N/A	No	No	It didn't.

#	Critical Event Summary	1. Was this event and the knowledge gained from it a threat to my staying in the school system?	2. How does this event compel me to question the system?	3. By reframing this event as a *challenge* to the school system, could I uncover the system's hidden nature?	4. Could an expansion in awareness inspired by this event be a direct cause for my leaving teaching?	5. How did this event raise my level of awareness about the system?
5	In my second year as an elementary teacher with a class of thirty-two, 25% of whom required 100% of my attention, I quickly began to wonder if I was suited to teaching.	Yes	I question the formation of the system, e.g., class size.	Yes: There are constraints invisible to the beginning teacher.	Absolutely. This allowed me to see the huge flaws in the system.	I became aware of the hidden constraints of the system.
6	When a colleague first spoke the words, "I support a student's right to fail," I was sure I heard wrong. But I have come to understand the significance and importance of this statement.	No	I question why the decision-makers are not the ones living with the decisions.	Yes: You must abide by decisions whether you agree with them or not.	Maybe indirectly. It was more a lesson about different opinions.	I became aware of my programming with respect to my beliefs about teaching.
7	As a mature adult, I learned that I was an auditory learner along with 40% of the population, which might explain why I struggled so much with all of the required reading.	Yes	I question a system geared toward the success of the few and not the many.	Yes: The system is inadequate for many learning styles.	Absolutely. This allowed me to see the huge flaws in the system.	I became aware of the fact that the system is incapable of providing successful learning for all students.
8	Watching a thought-provoking movie at exactly the moment I was ready for the topic (metaphysical in nature) changed my perception of science.	Yes	I question the formation of the system, e.g., the teacher-centred classroom.	Yes: Teaching is limited by a variety of factors.	Not really. I felt this was growth I would have experienced anyway.	I became aware of the fact that the Masters is one's first experience of a 'real' education.
9	In a doctoral course I learned that before the 17th century, science and religion shared a common goal: to learn the Truth.	Yes	I question historical accuracy as taught in schools.	Yes: Information we are taught is often outdated.	Absolutely. This allowed me to see the entrenched nature of education.	I became aware of the censorship that goes on in education.

#	Critical Event Summary	1. Was this event and the knowledge gained from it a threat to my staying in the school system?	2. How does this event compel me to question the system?	3. By reframing this event as a *challenge* to the school system, could I uncover the system's hidden nature?	4. Could an expansion in awareness inspired by this event be a direct cause for my leaving teaching?	5. How did this event raise my level of awareness about the system?
10	Once I started learning about aspects of the school system of which I had not been aware, I began taking liberties and deviated more and more from the prescribed curriculum.	Yes	I question the formation of the system, e.g., number of gym periods per week.	Yes: Invisible restrictions, like amount of physical activity, are plentiful in the system.	Absolutely. This allowed me to see the huge flaws in the system.	I became aware of the fact that the system does not educate the 'whole' child.

Once I do so by reflecting on the ten turning points, five questions emerge that relate to the school system (shown above in Table 4.2). For me, answering these questions brings me to a place of solace and understanding. Hopefully, as you read the results of this process presented in the table below, you will develop a better sense of the conflict I have been feeling and acquire a more satisfying explanation regarding my state of *ungroundedness*.

Compared to the earlier self-assigned exercises, completing this chart proves to be a much more fruitful endeavour. Metaphorically speaking, it allows me to remove the cloak that veils the machine in which I have been an unconscious cog. I use the term *unconscious* to signify the fact that I wasn't aware of the many hidden aspects of my role in the school system, that is, until I began learning about them in my doctoral courses. This does not mean that I am blameless, for as the law states, "ignorance is no excuse." In my defence, the more fully aware I become of my participation in the system, the more I am moved to action. Accordingly, I remove myself from the elementary classroom in June, four months later. I must add, however, that I do allow close friends and colleagues to talk me into teaching candidate-teachers for another year based on

the argument that they are adults who attend classes of their own accord. Eventually though, the awareness that I am preparing them for the same system I have chosen to leave makes it too unbearable to continue. At that point, I say goodbye to teaching altogether.

Mezirow's (1998) thinking on personal transformation is especially relevant to me at this time because it helps to provide some answers regarding how one so committed to her role as a teacher does something completely unexpected and leaves the profession shortly after she begins the doctoral program. The possibility that the disillusionment and disequilibrium I experience might produce transformative learning does offer some consolation regarding my decision to quit teaching. It allows me to think that perhaps the *transformed me* is more aware and inspired to take action by leaving the system now that I more fully understand my role within it.

Revising the Metaphor

Through the activities of the preceding section, I am able to find closure and finally feel capable of answering the original question, *How did I end up here?*, with conviction. Consequently, I am completely ready to close the book on the research, and even abandon the idea of analyzing others' responses to my critical events. With respect to the quest I have been on, I feel emotionally spent and really do not want to waste another waking moment on the project. To add insult to injury, when faced with the tedious task of coding, I can barely bring myself to open the computer. Yet there is still a lingering feeling that I have more to do, and I believe it had something to do with reuniting science and spirit. Although at this point, I am really not sure how.

When moments like these present themselves, I follow my intuition, which in this case means returning to my earlier idea regarding awareness. By directing my attention to the right side of Table 4.1 (*insights* and *emerging questions*, on pages 106 and 107), it is

quite obvious to me that critical events really do lead to an expansion in awareness. In conversation with an insightful friend, we determine that the pertinent, next question is: Do later critical events build on earlier ones, thereby accounting for the expansion in awareness? In order to answer that, I need to review the results of my coding to see if I can trace the cumulative effects of the events by theme.

Table 4.3. Prevalent Themes and Their Corresponding Critical Events

Theme	Corresponding Critical Events (listed by number – see left-hand columns of Tables 4.1 or 4.2)
Naïveté – my ignorance about the world	1, 3, 5, 6, 7, 8, 9
School as Authority – where individual/family/cultural values come second (or lower)	1, 2, 3, 6, 7, 8
Religious Influences	1, 3, 9

For this purpose, I select the three most popular recurring topics that surface during the data analysis: *naïveté*, *school as authority*, and *religious influences*. Next, it seems logical to assign each of the critical events vis-à-vis the corresponding themes (see Table 4.3).

As noted earlier, up until this point my critical events seem largely unrelated. However, when grouping them according to themes, there appears to be some congruence. This is most apparent in the thread labelled *naïveté*, which I can attribute to the majority of my critical events (see the first row of Table 4.3). Although, upon closer inspection, I quickly realize that the potential linkages are either too weak or too complex to deserve further analysis. So I decide to acknowledge their potential for future study, then turn my attentions back to the question of expanded awareness.

At that moment, it occurs to me that my map metaphor needs to be revised. In terms of progression, critical events no longer appear to be 2-dimensional turning points, but incidents of upward movement, especially now that I plan to incorporate the notion of expanding awareness. This prompts me to move to a *mountain climbing*

metaphor, where each critical event can be represented by a plateau. And each plateau would afford a new perspective following an arduous climb. So far, the updated analogy appears to be working. Inspired, I decide to see how far it might take me.

To test the concept of cumulative growth and expanded awareness, I return to Table 4.2 to see if any other trends emerge. After careful inspection, I arrive at the following conclusions:

- While critical events share similar themes, they tend not to build on one another in any overt, recognizable way.
- The lack of evidence of any cumulative effect suggests that plateaus might exist on different ridges in the mountain-climbing metaphor.
- The fact that I ultimately reached a plateau where I could no longer deny an expanded view (the hidden aspects of the school system) suggests that the overall climb can be considered cumulative, just not in any way that links critical events together.

Despite my disappointment with the new metaphor, it does allow me to make a few key observations. First, it reveals the possibility that there may have been a point along my journey at which I was able to see ***too much***. Whether it be designated the point of no return, critical mass, or the tipping point, it was likely at that moment that I reached the threshold of perceived, negative information I was able to bear regarding the school system. Once I passed this threshold, I entered the phase of disillusionment.

The second important insight that can be gained from this exercise is the explanation regarding how awareness, or consciousness, might actually be raised. It may be that there is no obvious progression that one can follow or orchestrate in order to raise her or his consciousness. (So much for self-help programs!) Instead, it may just be beyond our control. In my case, although I become a changed person in the end, I am still unable to identify any single event or group of events responsible for the overall transformation.

Nonetheless, I do feel I possess an expanded sense of awareness, which gives me more of a global perspective regarding my critical events, the accompanying disillusionment, and ultimately, the person I have become. I am changed not only mentally and emotionally, but spiritually as well. What's more, I can no longer look at these events as trivial, learning experiences. Instead, they are critical, unplanned steps whose significance can only be determined after the fact. Now, I need to see if I can find others who support my hypothesis that critical events can expand awareness, and hence consciousness. So the next place I look is to my critical friends.

Chapter 5.

Putting the *Ethno* in Autoethnography

"We are all kernels on the same corncob."
~ Pueblo Indians of New Mexico (Cajete, 2000, p. 287)

Are Critical Events Universal?

When I look back at the critical events I have shared with others during my life, I realize that every single one is a story that I carry with me, ready to pull out and dramatize whenever the conversation warrants. Is it because they possess specific qualities that earn them higher ranking on Sue's list of *All Time Best Yarns*? Or do they represent those important moments that everyone experiences at one point or another? When I originally communicated one of those anecdotes to David, he reaffirmed one thing: that the account about writing up chem labs resonated strongly with him, and he was immediately able to recall a similar experience. In this chapter, I explore the possibility of grounding the phenomenon of critical events in others' experiences.

If we are indeed story-telling creatures leading *storied* lives, as suggested by many (Bartlett, 2000; Bochner, Ellis & Tillman-Healy, 1998; Bruner, 1991; Connelly & Clandinin, 1990; Egan, 1988; MacIntyre, 1985; Panksepp, 1998), then to what degree can my accounts be extended to others? Inspired by David's reaction to hearing my critical event, my analytical mind quickly sets about generating a series of questions, imagining how other friends might react: "Does my story bring up any strong emotions for you? If so, which ones? Which aspects of my event are reflected in your experience? And what

elements are unique to me?" Through this process of reflection, I realize how much of a storytelling creature I actually am. This makes me wonder how comfortable others might be when it comes to sharing their stories with me, or if they even possess the same enthusiasm about divulging personal stories as I do.

For the purpose of giving you a sense of my interactions with critical friends, I shall draw on the journal entry that shares many of the features of our conversations. On pages 103 and 104, you may recall that the anecdote about *failure* was the most popular choice among the five critical events presented. I have chosen to use this example because it illustrates how individual as well as collective commentaries arise from the different exchanges. In some cases, voices echo similar thoughts and opinions, while in others, I acquire unique insight into the diverse ways people look at things that are different than my own.

During my first meeting with participants, I ask them to view the preselected Youtube video in which I share the story about a student's right to fail. Once they submit the electronic survey related to video, we begin the interview, during which time we discuss their reactions to what they had seen. Based on these exchanges, one straightforward observation I am able to make is that all critical friends can easily articulate whether or not the story resonates with them and to what degree. Furthermore, everyone admits that they can relate personally to the issue of failure. However, what is not unanimously expressed is *why* they chose this story over the others, as illustrated by their rationales below:

- It resonates with the work I do with distressed students, expectations these days of both parents and students, and how I believe that failing really is an important part of the learning process.
- As a teacher, the topic of failure really intrigues me and makes me want to hear more and have a discussion about it.

- It is because of my emotional response that I chose it. At one time I totally understood where those teachers were coming from - now it just infuriates me.
- While I was teaching in a private school, the headmaster said this a few times and I thought it was a bit strange to hear. Suddenly it popped into my world again and I think it implies some responsibility on the part of students in their own success.
- Failure is something I have experienced in my own life.

These results inspire me to look more closely at our conversations, which then lead me to make a few observations regarding the attributes of communication.

Upon analysis, I note how diverse the scenarios are around the selection of the *failure* story. Several people reference the workplace, some express emotion, and one mentions personal experience. Yet everyone relates to failure in their own way. Hence, my first observation speaks to the degree of connection to a topic that is required before people feel like they're *sharing* an experience: *Once we believe we are connecting on the same topic, there is an unspoken agreement that the conversation can continue despite our varying degrees of connection. From then on, only details or fine-tuning are required whenever it feels like we aren't still on the same page.*

On the rare occasion when critical friends and myself can find no common ground on which to base a continued discussion, it appears to be due to complete unfamiliarity with the thoughts and emotions of the other. This suggests that the experience may be unique to the speaker, or, that there is a difference of either opinion or experience held by one of the parties. This leads to my second observation: *When aspects of a critical event are not shared by both parties, the conversation changes direction or negotiation takes place.* Incidentally, those moments of negotiation, or *dissonance*, become opportunities for learning and growth in all instances.

Finally, in my third observation I believe that everyone desires to participate in harmonious communication: *When communicating with critical friends, we all look for*

ways to connect or relate, which in this case is through the concept of failure. Once a connection is established, everyone actively listens and responds to what is being said. It is easy to sense an eagerness by participants to share and advance ideas in such a way that makes everyone feel as if the conversation is moving forward in a positive direction. There also seems to be an unspoken negotiation that transpires, which is guided by a balance between complementary and contradictory statements. As a result, the exchanges feel very safe and nurturing. In terms of mirror neuron research, I suppose one could say that our neurons are firing in unison.

Because I am both intrigued and honoured by my critical friends' open communication, I contemplate how our conversations impact my understanding of the way in which we share critical events. What I come to realize is how we all willingly venture into sharing a space and time together, one in which we endeavour to preserve the delicate balance between two things: 1) our desire to connect with each other, and 2) our need to maintain a sense of self. So, when it comes to making connections, I begin to speculate about what creates our urge or impulse to find commonalities between each other. Are we sharing some pre-existing invisible field that causes us to feel connected? Or are we experiencing some kind of magnetic pull toward each other that contributes to an expanded sense of belonging? I decide to include this aspect of *connectedness to a greater whole* as part of my future investigations.

With respect to maintaining a sense of self, I cannot help but think of the ego (Freud, 1923/1961). I am instantly reminded of teaching middle school – a time when students become acutely aware of themselves as individuals (either painfully or painlessly) and respond accordingly. This prompts me to question the importance of *self* versus *the collective*. Is it an evolutionary development to promote one's self interests over those of others? And now, in the 21st century, what are the benefits that derive from a strong sense of self?

As I struggle to reconcile these musings in a way that might offer insight to my study, I return to the idea that in order to study an expansion in awareness, there would have to be some sort of change in the self that takes place. Thinking back to those middle school adventures, I question whether or not the physical changes taking place during puberty play an important role in raising one's consciousness. Based on my experience teaching adolescents, I find this possibility difficult to believe. Nonetheless, it does reveal a potential area requiring consideration regarding what I feel should qualify as an expansion in awareness. Therefore, I make a note to revisit this topic then explore it in the next chapter.

Finally, allow me to respond to my original question and the title of this section, *Are critical events universal?* Or, worded differently: Are there certain critical events that we've all experienced, like the failure example described above? In view of my analysis, the short answer is "no." However, this finding does urge me to reflect further on the significance of failure, and to speculate whether or not there are certain critical events that one can call *universal*. While intuitively I sense this is unlikely, it occurs to me that communities which endure particular suffering or tragedies together might find some commonalities in this regard. However, once again I deem this beyond the scope of my study.

The Speaker Becomes the Listener

As I come back to the recorded interviews seeking further inspiration, I am reminded of the words of Grumet (1987), "When we work with life history, the autobiographical act is not complete until the writer of the story becomes its reader" (p. 325). Her words speak not only to the power of reflecting on the key turning points in my life, but also to the importance of moving from *speaker* to *listener*. Inspired by this quote and the significance Castaneda places on personal recapitulation, I am motivated to ask participants to share their critical events during the second round of interviews. I

know that hearing about their histories will give me some new perspectives while providing me with deeper insight into my own journey.

As I listen to each of my critical friends respond to the questions I present to them (listed on pages 89 and 90) regarding their own critical events, I become acutely aware of the special space into which I have been invited. I really had no foresight into the types of stories they would share with me, nor how much trust in me they must have to expose their thoughts in the ways they admit they have rarely done with others. I realize that these moments are like rare gifts that they are conferring on me and I am eternally grateful. I soak in the experiences as much as I possibly can.

To illustrate the intimate nature of what critical friends confide to me, I will share one noteworthy exchange. During the last of my round-two interviews in which I anticipate listening to a participant's critical event, she informs me that she does not wish to share a personal story at this time, and instead is opting to redo the process from round one. Trying to hide my surprise while ensuring that I convey the utmost respect for her decision, we repeat the round-one activity. As we conclude, I tentatively ask if I might inquire about the reasons why she does not feel comfortable with the request, since I know her answers will provide me with some valuable insight into the nature of critical events that I do not currently possess. Graciously, she accepts.

In the conversation that follows, I learn about the process that this individual went through when trying to select a critical event to share. First she confesses that she has had a busy week and did not have the time needed to come up with one that she found suitable. Next, she admits that while she could share important moments in her life, like her children's births, she feels that these are common events that might not add anything unique to my study. Finally, she adds that there are other things she knows would qualify, but they are too personal and not stories she would feel comfortable sharing. Thanks to her willingness to illuminate why critical events can be difficult to share, I receive some very important information about the roles that time, place,

privacy, significance, emotional nature, and sensitivity can play. This opportunity makes me that much more grateful to my critical friends for being so open and trusting. Thank you, Critical Friends!

Although I decide not to include specific details of participants' critical events in this dissertation (explained in Chapter 3), there is a great deal I learn from my exchanges with critical friends. Regarding the descriptions I do provide, I endeavour to weave together enough of these co-constructed experiences to enable you, the reader, to appreciate how the processes included herein have shaped my journey. As a further illustration of the impact that sharing critical events with friends has had on me as well as on this study, I elaborate on a very special *teachable moment*, as we call them in the teaching world, below in *An Unexpected Gift*.

But before we leave this section, recall my earlier answer to the question, *Are critical events universal?* You may have noticed that I respond to only one interpretation of the question when in fact there are two. Now that I have conducted round two of my investigation, I would like to address the second possible meaning, which I might rewrite to read: Do all participants personally experience critical events? In this case, the answer is now an emphatic "yes," which indicates that critical events are indeed *universal*. Furthermore, based on the summary of all the data I collect, I propose that critical events possess the following qualities:

- Critical events are charged experiences. Some are positive while others are negative. They're deeply personal and can be highly sensitive.
- In the retelling of a critical event, everyone comes to see it as being a positive, important step in their journey.
- Critical events can trigger memories and reactions for the listener.
- Critical events reveal things about people that are often kept private.
- Critical events create self-wonderment and self-knowledge in the individual experiencing the event.

- Critical events are indelible; that is, they leave a permanent mark in one's memory.

The wonderful thing about critical events is that it appears no one is excluded from having them. What is even more promising is the possibility that critical events might lead to an expansion in awareness, and hence consciousness. This would mean that regardless of the nature of one's life experiences, everyone's personal critical events have the potential to inspire growth and knowledge.

An Unexpected Gift

A number of times now I have commented on the unpredictable nature of my enquiry and the rewards that come with being open to wherever the road might take me. Such is the case in this next example when I listen to one participant share his critical event about spending a year in the hospital after a close encounter with death. However, the details of the account I share in the paragraphs that follow are not about him, but instead about me, and the remarkable things I learn about myself during the hour we spend together in conversation.

Unlike the other interviews in which I inquire unabashedly about people's critical events, I approach this one tentatively, almost as if I am walking on egg shells. I say this because I am asking personal questions of a critical friend from the Haida Nation, and I am not entirely sure about how they will be perceived. As you may recall, Indigenous cultural knowledge was not one of my strong suits earlier in life. In later years, I could be accused of possessing a romantic, idealist view of First Nation cultures and values. Until one day when I was presented with a different perspective. I was informed that it was a white person's luxury to have such an outlook, as I did not have to endure the hardships and tragedies that also make up First Nations history. I found this to be a very humbling experience, and one that taught me a great deal about worldviews. Consequently, I proceed cautiously and respectfully while I try to absorb as much as I can about these

cultures, which have been living in harmony with Mother Earth since time immemorial. As you can hopefully imagine, it is a very special hour for me to be able to share in this rare privilege.

The first observation I am able to make is about the nature of our communication: how it seems to take place outside of the space-time continuum. There is a sense of spaciousness I have never before experienced. If I had to describe it, I would say our conversation is moving along at the speed of nature, like the pace of a resting heartbeat – slow, steady, and rhythmic. As I take in the surreal feeling of time, I become aware of a presence. I realize it is a presence that exists within me, almost as if there are two 'me's – the 'outside me' doing the speaking, and the 'inside me' forcing the 'outside me' to slow down and wait patiently for thoughts to arise before I speak. These sensations make it very clear to me that we have created a sacred space; a space that extends beyond our physical bodies which is safe, accepting, and inspired.

Another aspect of the experience that I find to be very profound is the deep connection I feel to my critical friend as I listen to him speak. Much of what he describes relates to the Haida culture and life situations I cannot possibly know. Nevertheless, I sense a bond between us that extends beyond these differences. I can only wonder: Where is this sense of connectedness coming from? As if able to read my mind, he shares his discovery that empathy is the key to overcoming cultural misunderstandings and thereby connect with others. I make a note to come back to this later when I would have a chance to think about the implications of his statement. Afterwards, when I am able to consider what he might have meant by the word *empathy*, I feel called to create my own definition: alignment between the perceived realities (emotions, thoughts, experiences, etc.) of two or more individuals that causes each to lose her/his sense of *other* and join in a sense of oneness. Inspired by our time together, I choose words that reflect what I have learned from him. I also notice that my description captures elements of an

experience which are not normally considered part of empathy. Overall, I am intrigued by the feelings that this exercise evokes.

As you might imagine, this unique opportunity really stretches me as a person. Because I am presented with variables that I have not dealt with in any of my other interviews, I am able to take away some valuable lessons. Among them, I realize that I have been making assumptions about my communications with those who appear to come from the same culture as I do, and possibly missing chances to learn more about them and about myself. I also discover that in the Haida culture, one must not ask elders questions. Instead, elders offer answers when they think one is ready for them. For this reason, I am grateful for the special privilege of being able to ask questions of my critical friend (although once again I feel awkward about my ignorance).

And as a third lesson, I gain knowledge about the rich opportunities for learning that present themselves when people share critical events, especially when they possess differing worldviews. This propels me to ask: Is there more value to sharing our critical events than just satisfying a graduate's research study? Immediately Byron Katie's personal-enquiry program, "The Work" ("Byron Katie International," n.d.), comes to mind, and I wonder about creating a process that might help others along their journey by incorporating what I've learned from my amazing experiences with critical friends. I decide to pursue this idea in the next chapter.

Do Critical Events Lead to an Expansion in Awareness?

In a final communication to critical friends, I ask for their assistance with my project's latest development: the potential linking of critical events to expanded awareness. By responding to a series of questions (found on page 96), they will not only help me with this endeavour, but allow me to extend my observations from *self* to *others*, as I set out to document whether or not we share similar experiences.

Table 5.1. Survey Results: Linking Critical Events to Expanded Awareness

Questions	# of respondents*
1. Was your critical event *thrust upon you* or did *you initiate* the event intentionally?	7 out of 9: thrust upon me
2. If you experienced an expansion in awareness, did this happen *before*, *during* or *after* our meeting?	6 out of 9: before 2 out of 9: during 1 out of 9: after
3. Do you think there are different levels of consciousness among people?	9 out of 9: yes
4. If so, did your critical event contribute to an expansion in your level of consciousness?	7 out of 9: yes
5. Would it be fair to say you were a new person because of this critical event?	8 out of 9: yes
6. Did this event inspire you to search for answers?	6 out of 9: yes
7. Did you reflect back on the critical event to any significant degree before you participated in my research?	8 out of 9: yes
8. Would you say self-reflection is something you do regularly, sometimes, or never?	8 out of 9: regularly
9. Would you say you had any type of extra-sensory or paranormal experiences associated with the event?	2 out of 9: yes

*Due to injury, one of the critical friends was unable to participate in this survey.

Because of my rekindled excitement in the project, I am most interested in the results of this section, as it has the potential to increase my understanding of critical events in a unique way.

When observing the survey results found in Table 5.1, it is clear to me that there are some significant statements that can be made. First and foremost, participants confirm that critical events most definitely lead to an expansion in awareness. What may also be interesting to note is that for them, these events are mostly unplanned, which has been the case for me as well. This reaffirms the belief I expressed at the end of the last chapter that we cannot orchestrate our own paths to enlightenment. I liken the chances of expanding one's consciousness to winning the lottery. You can buy as many tickets as you like, but that doesn't mean it increases the likelihood of having your numbers called.

Another powerful feature that emerges as a result of analyzing the data in Table 5.1 is the ability to add the following attributes to my list characterizing critical events (on pages 124-125):

- Critical events are almost never planned.
- Critical events can lead to an expansion in awareness.
- Individuals see themselves as *new* people as a result of their critical events.
- Critical events often inspire a search for answers.
- Most people believe critical events are responsible for an expansion in their level of consciousness.
- Critical events can promote reflection (although my critical friends reflect regularly, so it is difficult to say to what degree this takes place).

In spite of the informative survey results, however, there are a few new questions that surface. For example, I wonder how differently my critical friends interpret the terms *awareness* and *consciousness,* since I don't define them beforehand. Can it be that we share a similar cultural interpretation, thereby giving us a sense that our meanings are the same, not unlike my earlier hypothesis about connecting or relating to each other? Considering what I learned about assumptions in the last section, without asking my participants to qualify *their* definitions and elaborate on what they understand the questions to mean, I really can't be sure. Had the final questionnaire not been a last-minute addendum, I might have been able to address this issue earlier in the study.

In fact, by comparing the questions about expanded *awareness* (Table 5.1: question #2) and expanded *consciousness* (question #4), I realize from the totals in the right-hand column that participants do not perceive the two to be interchangeable. Can I infer that the variation in numbers confirms my suspicion? "Doubtful," is the response. In the end, I decide that for my purposes I will work with the participants' interpretations despite these discrepancies, since the focal point of my interest involves

their *perceptions* of an expansion in either awareness or consciousness. To echo Koch's (2004, p. 4) earlier words, "consciousness is an intensely private matter," so I shall regard my critical friends as experts on their own levels of awareness or consciousness.

Additionally, I contemplate how important reflection is to the process of increasing awareness. Suppose, for instance, my critical friends did not regularly reflect on the events of their life. Would that mean they cannot experience an expansion in awareness? Or, must there be some impetus, some driving force required, that compels them to reflect and hence, take away the learning? Once again, I go to Table 5.1 for answers. I note that three participants, or one-third, claim that their expansion in awareness comes as a result of our conversation (see #2: 2 *during* and 1 *after*). This causes me to wonder if they would have missed an opportunity to expand their awareness were it not for this study.

Stepping back, I ask myself: What are the conditions involved in increasing one's awareness? Is it attainable only through reflection, such that one must look back to an earlier *less aware* self to remark the change in perspective or perception? And if so, what does that mean for the non-reflective portion of the population? Alternatively, can we be reflective/reflexive about one aspect of our lives and not others, or are we simply reflective or not? Again, I think back to the possibility of creating a process like Byron Katie's, which provides people with the tools to carry out their own recapitulation, and thereby gain the benefits that I have witnessed here.

Moreover, I am left to contemplate the implications that this study might have on the greater good. By reflecting on critical events and increasing our consciousness, is it possible my critical friends and I are engaging in a process that takes place on some invisible, spiritual level, unbeknownst to us? Do we raise consciousness through *entanglement* or *morphic resonance* that might somehow influence the field in which we are all connected? And can these changes be measured in any scientific way, as a new paradigm takes over?

This, in turn, inspires me to modify my earlier definition of empathy to read, "two or more individuals sharing a *field*, which causes each to lose her/his sense of *other* and join in a sense of oneness." Thinking back to my conversations with critical friends, I wonder if I might have been acknowledging our *empathic* exchanges through my use of the words *special* and *sacred* when describing the space we occupied together. Perhaps without knowing, I could sense the subtle forces of the energy fields that we were sharing. If so, might Sheldrake agree that critical events are not only influencing the people in my study, but others outside the project who resonate with the same morphic field? And extrapolated further, what impacts might these events have on the formation of future fields, and hence, future events?

These questions intrigue me, and I am drawn to contemplate the possibility of a morphic resonance in which I am no longer *directing*, but instead, *responding* to the influence of the field around me. This possibility makes me think of McTaggart's research, which initially inspired the enquiry into the boundaries of *me* in Chapter 2. In my mind, when she discusses mirror neuron research, she is highlighting one of those extraordinary moments in which science is finally catching up to the wisdom of the Eastern and Indigenous traditions – that we are all *connected*. We are all One. The confirmation of Rizzolatti's experiment that two brains can function as one then forces me to ask: In time, will science find explanations that support all of the Eastern and Indigenous teachings? Something resonates deep within me regarding the implications of this question.

Chapter 6.

Standing in My Truth

"All truth passes through three stages: First, it is ridiculed; second, it is violently opposed; and third, it is accepted as self-evident."
~ Arthur Schopenhauer (von der Wagon Brecht, 2007, p. 104)

Full Circle

While I carried out the steps of my enquiry in an attempt to answer the question, *How did I end up here?*, little did I know I would be putting together the pieces of a puzzle I thought I had solved when I was first introduced to Charles Darwin. (If you haven't already done so, please read *Learning About Evolution* in Appendix B). In a sense, the same dilemma that faced me then, when I tried to resolve how I might remain in the sciences at university while being a devout Catholic who believed in the Creation story, resurfaced more than two decades later as I tried to imagine how I might continue in the school system given the new information I was discovering during the doctoral program. In other words, *Could I make peace with the fact that what I believed seemed to be in direct conflict with the doctrine of the system in which I found myself?* Interestingly, in the first case, I was able to come to terms with my predicament, whereas in the latter, I felt compelled to leave.

Based on the knowledge I now possess having conducted this doctoral research, I propose that critical events have the potential to play a significant role in our lives if we take the time to reflect on them. Furthermore, I contend that reflection on these events offers the ability to expand awareness, and hence consciousness, regarding the persons

we were at the time of the events and the persons we become through the process. The purpose of this chapter, therefore, is to reveal the details of the following discoveries, which have emerged during the research process:

- why this study qualifies as a *critical event*
- how the reflection process has expanded my awareness
- that others might benefit from my process
- how perennial philosophy might lead to a new scientific paradigm
- why a classification called "spiritual critical events" might be in order

Each of these points is addressed in the following five sections.

Deconstructing the Process

Much to the chagrin of any doctoral student who faces revisions from her committee during the editing process, this chapter's original content is but a distant memory. However, had I not been encouraged to make these changes, I would never have had my 11th-hour epiphany – *that this dissertation documents my* ***eleventh critical event!*** I'm not exactly sure how it occurred to me (although I feel inclined to suggest morphic resonance or energetic fields), but I came to this realization late last night. Needless to say, it was a very timely insight that has inspired new momentum in the rewriting of this chapter.

Once again, that left-brained, logical side of me has taken over and deemed it most appropriate to review the data of the preceding two chapters to determine if indeed this enquiry qualifies as a critical event. In order to do so, there are several aspects on which to base such a confirmation. First and foremost, it must satisfy the criteria that were developed in Chapter 4.

Table 6.1. Satisfying the Criteria for a Critical Event

Critical event

- an event which produces a dramatic alteration to one's life path, synonymous with a turning point, characterized by one or more of the following:

Criteria	Satisfying the Criteria
a dramatic change in attitude, emotions or well-being, and/or a dramatic change in health	a state of disillusionment; a sense of having no direction
a significant re-evaluation and/or change of values/beliefs	an inability to remain in the school system and carry out the role of teacher, forcing me to quit
a significant change in the person you were before the event (noticeable to yourself and possibly others)	a change from someone who loved teaching in the school system to one who no longer engages in conversations about education without warning people about my biases
or any other profound influences not mentioned but similar to those above	a philosophical shift away from systems toward spiritual endeavours, volunteerism and one-on-one exchanges

As I fill out Table 6.1 with ease and speed, it becomes evident that this event is authentically *critical*; the only caveat being that unlike most of my other critical events, this one lasted for many months. When reviewing the chart's content, I am able to remark that I was able to satisfy **all** of the criteria, despite the fact I informed participants that only "**one** or more" were necessary. Even more surprising, however, is the overall picture one can gain from the combined entries of the right-hand column, which succinctly capture the essence of my experience into and out of disillusionment. It causes me to wonder if, by examining critical events using this approach, people might be able to gain a bird's-eye view of their own situations that allows them to appreciate its importance and impact from a new perspective. This in turn urges me to consider how others might benefit from this process, and so I explore the possibilities in a later section entitled, *Pay It Forward.*

As a second method used to determine whether or not this doctoral study qualifies as a critical event, I find that retracing the four steps of the experiential process which emerged in Chapter 4 proves helpful:

1. I was faced with a scenario that created cognitive dissonance → this challenged my existing thoughts and beliefs (concrete experience)

2. I had a need to resolve these feelings of disequilibrium → this caused me discomfort and a sense of insecurity (reflective observation and abstract conceptualization)

3. I took action by choosing an outcome that most resonated with me → this returned me to a state of balance (active experimentation)

4. I observed that I had experienced an expanded sense of awareness → the new level of awareness could be categorized into one of the following: human nature, relationships, and the nature of the school system (reflective observation)

Following careful review, I can confidently state that I did indeed move through each of these phases while carrying out my enquiry. I am also able to remark the similarities between my process and Kolb's *Learning Cycle* (Kolb, 2005), noted above in brackets.

Table 6.2. Qualities/Traits of Critical Events

Qualities/Traits of Critical Events (from Chapter 5)	Yes, the statement applies (√)
Critical events are charged experiences. Some are positive while others are negative. They are deeply personal and can be highly sensitive.	√
In the retelling of a critical event, everyone comes to see it as being a positive, important step in their journey.	√
Critical events can trigger memories and reactions for the listener.	n/a
Critical events reveal things about people that are often kept private.	√
Critical events create self-wonderment and self-knowledge in the individual experiencing the event.	√
Critical events are indelible, that is, they leave a permanent mark in one's memory.	√
Critical events are almost never planned.	√
Critical events can lead to an expansion in awareness.	√
Individuals see themselves as 'new' people as a result of their critical events.	√
Critical events often inspire a search for answers.	√
Most people believe critical events are responsible for an expansion in their level of consciousness.	√
Critical events can promote reflection.	√

And while it might seem most logical for someone with my teaching background to pursue this direction of experiential learning theory for my research, I decided to take a more unconventional approach by examining my experiences in terms of expanding awareness.

In one final exercise to determine the appropriateness of applying the term "critical event" to this research study, I review the qualities and traits that emerged in Chapter 5 during analysis of the commonalities between critical events shared by participants (see Table 6.2). As it turns out, all but one of the qualities are highly relevant, which stands as a further testament to my theory that the thoughts and experiences detailed in this dissertation indeed qualify as a critical event. Through the creation of this table, not only am I able to test the data I collected, it also enables me to consciously witness and examine the unfolding of a critical event as it takes place in real time. It even offers insight vis-à-vis how the process might apply to others. All this comes as an unexpected yet delightful surprise. The next step is to determine if this event supports the hypothesis that critical events have the potential to lead to an expansion in consciousness.

Reflection, Expansion, and the "Conscious Observer"

In order to set the stage regarding the role of reflection and its potential to increase awareness, and hence consciousness, I shall begin by elaborating on the significance of being a *conscious observer* during my process, a concept which originally appeared on my scientific *radar* when I discovered quantum physics. First of all, due to the autobiographical nature of this project in which I have put myself at the centre of the research, I note that I am an observer of *myself*. This has interesting consequences since I act as both the *observer* and the *observed*. Immediately thoughts of

Krishnamurti's Eastern influence of wholeness reflected in Bohm's (1980) concept of implicate order come to mind. Their work suggests that the observer cannot be isolated from the observed, but instead must be *enfolded* in it, and only through the act of *unfolding* in a three-dimensional, time-bound space can the independent forms and events in this reality take place. (Thinking back to my earlier questions regarding why we don't acknowledge the scientist in the science, I am reassured by the fact that there are scientists and philosophers who publicly address this.) So, as the individual *enfolded* in her environment, I am cognizant of the potential growth and development that can take place during my *unfolding* process, which I describe below.

Further reflection upon this *observer-observed* relationship, especially its impact on critical events, prompts the following questions to surface: Who is the self **observing** the critical events? And how is she different from the self **experiencing** the events? I wonder about the possibility that these are two different selves, possessing different levels of consciousness and existing in different realities, and so decide to make a distinction between the *former self* who experiences the events and the *latter self* who observes them. My mathematical self wants to capture this idea in the following equation:

[*latter self* awareness] – [*former self* awareness] = amount of expansion in awareness

I would also maintain that reflection is the implied requisite action in this process which produces the expansion in awareness. Otherwise, the critical event is unconsciously assimilated and there is no sense that any changes have taken place.

In order for me to report an expansion in awareness in any significant way according to Western standards, I would need some sort of measuring device. So I turn to the two individuals from Chapter 2 who have provided possible mechanisms: Hawkins and Wilber. Each has created the means to determine levels of consciousness that permit me, the *latter self*, to confirm changes from my pre-existent *former self*. Yet, one

might argue that their consciousness measurement tools do not satisfy the rigours of modern science since there is currently no way to validate the resulting values, unless perhaps it were to involve large numbers of experts who can confirm my results in some statistical fashion. Since this will not be taking place, I shall present my own conclusions.

First, in order to use Hawkins' *Map of Consciousness* (Hawkins, 1998, pp. 52-53), I must apply his kinesiology technique to arrive at a numerical value. So, I invite my husband to assist by conducting the "muscle testing" on me. Surprisingly, I get a value of 506, which aligns closest to the level of love at 500. However, because Hawkins mentions that married couples are sometimes unable to use each other as test subjects (Hawkins, 2002, p. 68), the validity of my results can be called into question. Furthermore, in order to gauge an expansion in awareness produced by critical events, I realize that one measurement alone is not enough. I would also need to know what level I possessed at the beginning of the event, which I do not. Of course, I can repeat the process by holding the thought, "My level of consciousness when I began this research project was ___," but have elected not to since my original value is already questionable, and could therefore distort any calculations stemming from it.

In the case of positioning myself on Wilber's chart entitled, *Levels of Consciousness*, I review the *rungs* of the ladder and deliberate about where I might be. Though without a more complete understanding of his terminology, I can only surmise that I would lie somewhere between F-5 (self-esteem) and F-6 (self-actualization). Despite the fact that I cannot say exactly what my level of consciousness is, I realize there is a much more valuable insight to be had, which is: *As a result of this research project, I must have somehow moved up a rung!* That is to say, when I started the doctoral program, I lived in a condo in a large city and commuted an hour to work at an elementary school. Now, I live in a fifth-wheel trailer on an estuary in a small town, and other than writing this dissertation, I spend most of my time volunteering in the community or outdoors in nature. To me, the profundity of this realization emphasizes

the impact that reflecting on critical events can have when observing personal growth and change.

While endeavouring to show the relationship between expansion in awareness and reflection on critical events has been an important aspect of my study, the act of placing myself on Hawkins' and Wilber's charts to determine my level of consciousness feels much less rewarding. Other than having some idea about where I've come from and where I'm headed on my journey along the path to higher consciousness, I question the value of knowing my *number* or *level*, since I am doubtful it will assist in facilitating my future growth, as expressed earlier. Once again, I find myself wondering why we Westerners have such a predilection to measure everything. Does measurement somehow imply objectivity and therefore reproducibility? This question along with the voice in my head quickly remind me of the *conscious observer*, who in fact is the one responsible for collecting the objective, reproducible measurements in the first place, thereby inviting subjectivity into the conversation.

On the topic of subjectivity, I feel obliged to briefly acknowledge the roles that both memory and language play in this study. In particular, although critical events can be described as memories which are subjectively communicated through language, these memories act only as *signposts* pointing **toward** the actual critical events. That is, they are merely *representations*, not unlike our perception of reality, which in Chapter 2 are said to result either from projections of the brain or manifestations of the mind, depending on which position you take. For this reason, I do not cling too tightly to the accuracy of personal accounts, (my own included), since the deeper I have gotten into the research, the more *all* the boundaries begin to blur. While there are many theories regarding the role of memory and language, the intent is not to address them in detail here. I merely wish to draw attention to a potentially important relationship between memory, language, and subjectivity.

[I wish to give special thanks to Eckhart Tolle, whose notion of *signposts* in his book *The Power of Now: A Guide to Spiritual Enlightenment*, gave me my first peek into the world of signs and that to which they point (Tolle, 1999, p. 108). When this concept reappeared in graduate courses through Saint Augustine's *signs*, and later, through Descartes' dualist view of mind and body, it gave me a strong sense that I may have found my frontier between science (signpost) and spirit (that to which the science points).]

Pay It Forward

When I consider how I have been shaped by this whole self-designed process, beginning with the analogy of a map and ending with a state of peace, I am filled with gratitude. When I contemplate how I might share it with others, I feel drawn to present the steps I took in such a manner that those desirous of applying it to their own lives will be able to follow my simple procedure. I have no idea what kind of results this will produce for the reader, but I am hopeful it yields some form of insight or understanding regarding where you find yourself presently as your *latter self* in relation to where you used to be as your *former self*. Therefore, should you wish to examine one of your own critical events, read on. Otherwise, you can skip ahead to the next section of the chapter entitled, *Perennial Philosophy and a Paradigm Leap*, found on page 145. Disclaimer: Please note that this is merely an exercise of personal growth and exploration, so is not intended to replace any professional counselling or health care services in which you may already be engaged.

Step 1: Select a Critical Event

The first step is to select a critical event. In the case of my critical friends, one or more events tended to surface quite quickly, sometimes immediately. In some situations, however, individuals needed to reflect a little longer before being able to

recall events that they felt qualified or were comfortable enough to share. Do not be concerned about how much time it takes to come up with a critical event or what the event entails. This is a personal process and there are no right or wrong answers. As a guideline for making your selection, pick an event that satisfies one or more of the criteria below:

- the event produces a dramatic alteration to your life path
- you notice a dramatic change in your attitude, emotions or well-being, and/or a dramatic change in your health
- you find yourself re-evaluating some significant aspect of your life and/or you remark a significant change in your values and beliefs
- you notice a significant change in the person you were before the event, noticeable to yourself and possibly others (e.g., regarding behaviours, how you spend your time, who you spend time with, etc.)
- you experience other profound influences not mentioned but similar to those above

Consider starting off easy by choosing an event that does not scare or intimidate you. Many emotions can be called up during this process and it is important that you feel comfortable as you proceed. I would suggest that you begin by selecting a less daunting critical event to get a feel for the kinds of thoughts and emotions that might emerge before you choose a more serious one, which may stir up highly emotional reactions. One idea would be to think back to a positive experience that qualifies and start there. While it may not give you practice with the tougher emotions, it will give you an idea about what it feels like to stir up and sit with old memories.

When you have progressed to a place where you are ready to confront the larger events, be sure to have the necessary support in place in case you require assistance. Many of us have critical events that we have blocked out or repressed as a survival strategy. Feeling ready to look at them is a huge step, but doing the actual work of examining them can be very scary and painful. When you get to this point, treat yourself

as you would a dear friend, pet, or loved one; be patient, kind, and compassionate toward yourself.

Additionally, I believe it is important that you are open to accepting help if necessary, since you will likely be venturing into new territory. Help may come in many forms:

- a supportive family member or friend who can listen compassionately
- a support group in your neighbourhood that shares or addresses your concerns or issues
- an online community that allows you to peruse the information anonymously and at your leisure, in case those are important aspects of your support
- a professional who has been trained to provide the kind of support you are seeking
- a personal practice (physical activity, spiritual, religious, other) that allows you to remain or return to a state of centredness
- some other form of support that works for you but not mentioned here

Listen to your internal guidance to know how to proceed. We all have our own *conscious observers* who sit imperceptibly in the background ready to respond. I call this "inner knowing." In their studies, Radin and Schlitz refer to it as "gut feelings" and "intuition." You already *know* it exists. Now is the time to call on it.

Step 2: Record the Event

With your critical event selected, it is now time to record it. You may choose either to write or use an audio recording device to document your account. The importance of recording the details of the event is to be able to examine them later. As you carry out this step, however, your focus must be to allow your memory to flow freely without judgment or analysis. You shall employ a technique called "stream of consciousness" (James, 1890), which means that you observe your memory as it passes

through your consciousness, giving only minimal attention to the recording process. No thought should be given to grammar, wording, order, (spelling, if writing), or anything else that might distract you from recalling the memory uninterruptedly. Then continue recording until the process feels complete. You will know when this is by once again listening to your inner guidance. (To find out more about this technique, conduct an Internet search using "stream of consciousness" as your search term.)

Step 3: Reflect on the Event

With the results of the recording before you, you are now able to reflect on the critical event from the perspective of the *latter self*. Recall that who you are now – your *latter self* – differs from who you were – your *former self* – based on all of the knowledge, wisdom, and insight you have acquired during your life since the event. Furthermore, if my hypothesis is correct, reflecting on the event offers the possibility of expanding your awareness and can allow for a *shift in consciousness* as you re-examine the event from the perspective you now have.

In order to facilitate this process of reflection, I invite you to record the answers to the same questions that I posed to my critical friends once you have reviewed the results from the "stream of consciousness" activity in Step 2:

- Was your critical event ***thrust upon you*** or did ***you initiate*** the event intentionally?
- What changes in yourself did you notice during and/or after the event? emotionally, physically, other ...
- How were your values/beliefs altered by this event?
- How did this event change your view about yourself? Your life? Your relationships?
- What have been the long-term effects of this event? How has this event contributed to the person you have become?

- What did you learn as a result of this event? If there was a lesson to be learned by the event, what might it be?
- What emotions are stirred up for you as you recall this event?
- This critical event contributed to an expansion in my level of awareness (or consciousness) by... (finish the statement).

If you are like me, you have already noticed some interesting things about yourself by answering these questions. Maybe you realize that there were factors beyond your control in this situation. Or, maybe you see a theme that seems to repeat itself in your life. Perhaps, your strengths and/or weaknesses are becoming more evident now that you have become the observer of yourself. Whatever the case, it is up to you to conduct the sleuthing and arrive at your own conclusions. Remember! This is your journey and only you can discover what new insights and understandings can be gained along the way.

Step 4 (Optional): Create the Map

As you know, I initially carried out the procedure detailed above for a total of ten critical events. Should you decide to repeat the steps and create your own map, you will likely gain insight about yourself that cannot be acquired by analyzing one event alone. With respect to the selection process, though I cannot explain how I arrived at the number ten, I am able to make a few observations. First, I can say that two more critical events presented themselves during the writing of this dissertation, but for one reason or another they did not come up when I conducted the original brainstorming exercise. On one hand, this might suggest that it is easy to come up with multiple events. On the other, it shows that some critical events can be slow to reveal themselves, which leads me to my second observation. A few of my critical friends expressed concern that they could only think of *one* event, and some even had difficulty with that.

While I did not investigate why individuals struggled to come up with critical events, I might infer that it was caused by the strong language I used to describe the original criteria. In other words, if I had removed the words *dramatic*, *significant*, and *profound* (in Step 1 above), it is my sense that this difficulty would have been eliminated. Accordingly, should you have trouble coming up with critical events during this process, I suggest you remove the potentially restrictive language so that more life experiences qualify. For example, note the difference in tone between *"you notice a* ***dramatic*** *change in your health"* as compared to *"you notice a change in your health."* In the second case, many more examples may come to mind since the phrasing sounds much more open. I'll add the caveat, however, that it may be beneficial to distinguish between major and minor critical events on your map to see if this produces any new insights regarding your journey.

In the end, I am hopeful that this process brings you as much fulfillment as it did me. Certainly liberating myself from the state of disillusionment was a remarkable gift. It would be wonderful to think that as a society, we were all in the process of gaining self knowledge that allows us to have a more complete understanding about ourselves. And if I am correct in linking reflection on these critical events to a potential expansion in consciousness, then in theory, many of us together may be multiplying the effect.

Perennial Philosophy and a Paradigm Leap

Looking back on the overall process and how, in the end, my journey took me to the frontier of science and spirit, I have come to the conclusion that whether I ground my experiences in Western science, Eastern philosophies, or Indigenous traditions, all share some foundational principles. In the late 17th century, Liebniz called this "philosophia perennis," or *perennial philosophy,* to signify "the transcendental essence of all the main religions promulgated through their mystical traditions" (Friedman, 1994, p 96). Although I've included Western and Indigenous influences in the mix, I believe this

concept still applies. As detailed in the comprehensive work of Capra (2000) and his book, *Tao of Physics*, chapters dedicated to the following perennial-philosophy topics demonstrate Liebniz's claim:

- The unity of all things
- The world of opposites (e.g., yin and yang)
- Space and time are constructs of the mind
- The universe is ever changing (*Brahman* in Hindu, *Dharma-kaya* or *Tathata* in Buddhism, *Tao* in Taoism)
- Emptiness and form
- The cosmic dance
- Quark symmetries
- Patterns of change

Capra not only presents how these principles are shared by the Eastern schools of thought, but also relates them to current developments in physics, reaffirming that fundamental beliefs (or in this case, *principles*) are shared by many seemingly divergent groups. (As an interesting side note, the movie, *Mindwalk*, described in a journal entry in Appendix B by the same name, was based on Capra's book and created by him and his brother, Bernt Capra.)

Because of its relevance to my study, I draw attention to Capra's first point, "the unity of all things," as it appears to be the strongest theme emerging in my research that is shared by current views in Western, Eastern and Indigenous traditions. Recall that with respect to the Western scientific theories presented so far, the topic of unity may be found in the concepts of fields and morphic resonance in physics, mirror neuron research and epigenetics in biology, and the sense of interconnectedness experienced during out-of-body experiences. Although I did not explore *unity* from Eastern or Indigenous perspectives in this dissertation, I have learned of its importance to

Buddhists practicing the Middle Way (Lama, n.d.a), and how it relates to the interconnectedness of all things in Indigenous cultures, as illustrated by *cycles* and *circles*: the four directions, the four elements (earth, water, wind, fire), the seasons, the medicine wheel, healing circles, and talking circles, among others (Cajete, 2000; Clarkson, Morrissette & Regallet, 1992; Michell, Vizina, Augustus & Sawyer, 2008; Wolf & Rickard, 2003).

Thinking back to the words of His Holiness the Dalai Lama and Radin, I am also inspired to believe that all three of the above views might benefit from cross-pollination. However, I'd like to push this ideal even further and propose that under a new science paradigm, there exist a sort of *perennial philosophy of science* in which Western, Eastern, and Indigenous points of view are honoured. Any new theories, therefore, would somehow incorporate the combined wisdom and respect for each. I am aware that this sounds idealistic, especially since it would likely mean that any research which puts Earth or her creatures in harm's way would not be permissible due to the potential violation of the different groups' views. And of course this would have implications for animal testing, human health, economics, and a myriad of other issues, so my proposal must sound quite radical. Nonetheless, I do believe a *Terrestrial* perspective is required when developing this new science paradigm so that we may transcend the predominant materialist mindset and take the next step toward a fuller understanding of and respect for our place in the universe.

As a starting point to achieve such a goal, I begin by presenting two aspects of the existing Western science model that require immediate attention. First, we must acknowledge that the current paradigm of breaking things into smaller and smaller parts to understand them is a limiting one, not to mention, only *one* way of seeing the world. By taking a more holistic, "unity of all things" approach, we can explore our existence in terms of both *parts* and *wholes*, as illustrated in Bohm's implicate order, Haramein's unified field theory, Mandelbrot's fractals, Wilber's holarchy, and Capra's systems

thinking, to name a few. Such a modification also incorporates the non-Western teachings that maintain an *interconnectedness* of all things. Additionally, embracing divergent perspectives allows us to acknowledge that scientific knowledge is not finite, but an ever-growing body of learning based on relative perspectives and perceptions.

Second, based on my own observations, I feel it is necessary that we consider *how* subjective experiences might be considered scientifically valid where individuals' accounts are welcomed. It is my contention that the inclusion of first-hand accounts in research results in far richer, more expanded views of events. Like Sheldrake (2012), I have witnessed how materialist science has contributed to an "illusion of objectivity," mistakenly conveying the idea that experiments are being conducted in the absence of subjective, human influences, which "not only distorts the public perception of scientists, but affects scientists' perception of themselves" (p. 292). Although it continues to remain unclear exactly how to incorporate these first-person reports such that their inclusion does not confuse empirical aspects of research, the time has come for an epistemological pluralism in which science learns to address the human component so that these methods can be established and refined. Should we need guidance in this regard, we need only look to the ones leading the way, many of whom have been mentioned throughout this dissertation.

Reflecting on the definition of "science" that I have been using for the last decade – *a curious, unbiased, yet ethical pursuit of life's mysteries*, I can see that the principles I mention above are already reflected in it, even though it is just now in the writing of this section that I have come to articulate them. Not surprisingly, I can also see how these values crept into my teaching and contributed to the conflicted feelings I had about what I was teaching. I was forced to confront the same issue that is facing science now: that the old *operating system* is no longer working and it's time for a *system upgrade*.

Reuniting Science and Spirit

As I come to the end of my analysis, I reflect on the overwhelmingly strong conviction I have for reuniting science and spirit. *Where did it come from?* I wonder. Serendipitously, at the moment I ask this question, I find myself holding Tart's (2009) book, *The End of Materialism: How Evidence of the Paranormal is Bringing Science and Spirit Together,* opened to the page that reads: "*spirituality* is primarily about life-changing, primary *experiences* that happen to *individuals*" (p. 7). I cannot help but equate Tart's "life-changing, primary experiences" to *critical events*, so interpret his message to mean that spirituality is primarily about critical events.

As I contemplate the significance of this, it suddenly occurs to me that a number of the scientists included in this dissertation have reported experiences which might also qualify as *critical events.* In light of Tart's comment, it may be that these events can provide insight into the relationship between critical events and the intersection of science and spirit. Therefore, to investigate this possibility further, I shall present four personal accounts to determine how they might contribute to my overall understanding of critical events, as well as the potential science-spirit link. (As an interesting side note, another remarkable observation that can be made regarding these individuals is their call to found an organization that supports a cause related to their experience.)

Since he was the first of the researchers to come into my life, I begin with Fritjof Capra, who cofounded the Center for Ecoliteracy in 1995 ("Center for Ecoliteracy," n.d.). He shares details of his critical event in the preface of the first edition of his book, *Tao of Physics*:

> I was sitting by the ocean one late summer afternoon, watching the waves rolling in and feeling the rhythm of my breathing, when I suddenly became aware of my whole environment as being engaged in a gigantic cosmic dance. [...] As I sat on that beach my former experiences came to life; I 'saw' cascades of energy coming down from outer space, in which particles were created and destroyed in rhythmic pulses; I 'saw' the atoms

> of the elements and those of my body participating in this cosmic dance of energy; I felt its rhythm and I 'heard' its sound, and at that moment I knew that this was the Dance of Shiva, the Lord of Dancers worshipped by the Hindus. (Capra, 2000, p. 11)

Through juxtaposition of the terms "energy," "atoms," and "particles" with "the Dance of Shiva, the Lord of Dancers," Capra presents the powerful connection between science and Eastern mysticism that he felt during this event. He admits that it had such a profound effect, it eventually set him on the path that led to the writing of his book. Both are powerful indicators to me that this experience propelled him to expand his view of science to such a degree that it transcends the modern boundary between science and spirit.

By the time this *increase in awareness* took place, Capra (2000) had already been introduced to altered states of consciousness:

> In the beginning, I was helped on my way by 'power plants' which showed me how the mind can flow freely; how spiritual insights come on their own, without any effort, emerging from the depth of consciousness. I remember the first such experience. Coming, as it did, after years of detailed analytical thinking, it was so overwhelming that I burst into tears, at the same time, not unlike Castaneda, pouring out my impressions on to a piece of paper. (p. 12)

As an important point, Capra makes reference to the "power plants," commonly used by shamans in Native America (peyote) and South American (ayahuasca) Indigenous cultures as a way to induce "sacred states of consciousness" (Walsh, 2007, p. 192). Contrary to the western taboo of such practices, Tart (1971) too believes it is important to understand these altered states of consciousness, urging that science be more open in this regard and asserting that the scientific method can assist. It is very possible Tart would have described the accounts of Capra and Castaneda as examples of *cosmic consciousness*, a term first coined in 1901 by Canadian, Richard Maurice Bucke (1901/2000), to signify "a higher form of consciousness than that possessed by the ordinary man" (p. 1). Perhaps an openness to scientific investigation of these pivotal, life-

changing experiences has the potential to reveal information about some unknown realms that would vastly expand our understanding of the universe.

Next in line of personal influences is Edgar Mitchell, with whom I became much more familiar once I became a member of the Institute for Noetic Sciences ("IONS Overview," n.d.). I am particularly inspired by the uniqueness of what I consider to be his critical event, since it took place while in a spacecraft returning to Earth:

> Only when man sees his fundamental unity with the processes of nature and the functioning of the universe—as I so vividly saw it from the Apollo spacecraft—will the old ways of thinking and behaving disappear. [...] Humanity must rise from man to mankind, from the personal to the transpersonal, from self-consciousness to the cosmic consciousness.
> (Mitchell, 1974, p. 31)

In my mind, this statement suggests that Mitchell developed the *Terrestrial* perspective I mentioned earlier at some point during this mission, which hints that we may be closer to a *new science* paradigm than I realize. I should not be surprised to learn, therefore, that the mandate of his institute is to explore the science of topics like consciousness and psychic phenomena, which take us beyond the limits of the material universe, and incorporate aspects of spirituality, subjectivity, and scientific rigour.

As a third example of people who have expanded my conception of science, I was introduced to David Hawkins' kinesiology technique during a visit to my naturopath. However, it was just a few days ago while reading the preface of his book, *Power vs Force,* that I learned of two moments in his life which I believe qualify as critical events. The first one took place in 1939 as he was delivering newspapers. Having been caught in a blizzard, he sought refuge from the wind in a snow bank, when the following occurred:

> The shivering stopped and was replaced by a delicious warmth ... and then a state of peace beyond all description. This was accompanied by a suffusion of light and a Presence of infinite love, which had no beginning and no end, and which was indistinguishable from my own essence. I became oblivious of the physical body and surroundings as my awareness fused with this all-present illuminated state. The mind grew silent; all

> thought stopped. An infinite Presence was all that was or could be, and it was beyond time or description. (Hawkins, 2002, p. xiii)

In the midst of this mystical experience, he was found by his father and so reluctantly returned to his body, never sharing the details with his family.

In a second event decades later, he became fatally ill at the age of 38 during World War II. Filled with despair that there was no cure for his disease, he called out:

> "If there is a God, I ask Him to help me now." I surrendered to whatever God there might be, and went unconscious. When I awoke, a transformation of such enormity had taken place that I was struck dumb with awe. The person I had been no longer existed. There was no personal self or ego left—just an Infinite Presence of such unlimited power that it was all that was. [...] The world was illuminated by the clarity of an Infinite Oneness, which expressed itself as all things revealed in their immeasurable beauty and perfection. (Hawkins, 2002, p. xv)

As it turns out, this time he remained in the state of Presence for another nine months and can recall the difficulty he had returning to the outside world. Eventually, however, his life resumed and although he chose professions based in science (physician, psychiatrist, and researcher), his work has always been infused with spiritual elements as a result of these experiences. One significant example that demonstrates this union between science and spirit is his "Map of Consciousness," which from the perspective of science, incorporates quantum physics, nonlinear dynamics, and human muscle response, while from the viewpoint of spirit, delineates levels of spiritual evolution. This has been yet another exciting discovery for me, since Hawkins, like Mitchell, is adamant about applying scientific rigour to very non-traditional research, thereby pointing the possible way forward to a *new science* paradigm. (As an aside, Hawkins has participated in the founding or co-founding of too many organizations to cite here. Please view this reference ["About the Author," n.d.] to find a complete list.)

To complete my list of scientists having critical events, I draw upon Eben Alexander and his near-death experience described in *Proof of Heaven*. A combined

review of the summary I provide in Chapter 2 (see pages 66 and 67) along with my definition of a critical event, "an event which produces a dramatic alteration to one's life path" (on page 108), clearly indicates that his experience satisfies most, if not all, of the criteria. Although, what sets his story apart from the others is the about-face he makes with respect to his profession and beliefs. Put another way, his critical event causes him to change from *non-believer* to *believer*, and I mean this in the spiritual sense.

Ironically, up until this point in the study, I had not considered classifying critical events in terms of their spiritual potential. I had only tried to isolate common themes that appeared in the data of Table 4.1 (located on pages 106 and 107). And although I did ask people if any of their critical events included extra-sensory or paranormal experiences, it was not appropriate at the time to link their responses to spirituality. So, despite the apparent lack of connection between critical events and what emerged as the important theme of spirituality thus far, it seems logical and opportune to address this now. Therefore, I shall conduct a re-examination of the critical events above in an effort to gain some insight into the intersection of science and spirit.

Interestingly, inspecting the critical events for a second time yields some fascinating results. Without realizing it, I selected four scientists who had experiences that were spiritual in nature. Consequently, I find myself speculating about the implications that this might have regarding the potential effects of *spiritual critical events*. This, in turn, leads me to create the following list summarizing my observations:

- *Spiritual critical events* appeared to propel individuals toward scientific exploration that somehow incorporated a spiritual component.
- In at least 3 cases, *spiritual critical events* were mystical in nature and involved altered states of consciousness. One might argue that this finding reinforces and supports the Indigenous use of "power plants" as a pro-active way to induce "sacred states of consciousness."
- *Spiritual critical events* inspired individuals to act on a societal level by creating organizations whose cause is related to their experience.

With these new insights, it seems clear that I should consider creating a new classification entitled, *spiritual critical events*. Of course, another project would be required to explore its possibilities. However, looking back on my doctoral research as a test case (critical event #11), I can certainly say that it satisfies the first bullet point, since it has led to a conviction to reunite science and spirit so strong that it forced me to abandon my original doctoral thesis (*using controversy as a teaching tool*). With respect to the other two bullets though, personally I did not have any mystical experiences nor did I create any organizations. But perhaps these aspects are not required for a spiritual shift in consciousness that takes place imperceptibly over time, as would more likely be my case.

I shall close this section and the chapter with this poignant quote which, in my mind, signifies that even a scientist who openly opposed Bohr's "spooky actions at a distance," still possesses a profound respect for the force underlying all things. In Einstein's own words:

> Try and penetrate with our limited means the secrets of nature and you will find that, behind all the discernible concatenations, there remains something subtle, intangible, and inexplicable. Veneration for this force beyond anything that we can comprehend is my religion. To that extent I am, in point of fact, religious. (as cited in Kessler, 1971, p. 322)

Curiously, the word "concatenations" can be interpreted as *interconnected things*, like networks, or possibly even *fields*. This gives cause for wonder. Was Einstein in fact suggesting that he believed in a discernible field behind which exists an inexplicable force? To find his quote years after the disappointment of learning that Einstein believed the universe could be reduced to mathematical equations gives me hope. Perhaps, if I were to look less at peoples' words (or signposts), and more closely at their meaning (that to which they point), I might just discover that the evidence linking science and spirit has been there all along.

Chapter 7.

Conclusion

"The key to growth is the introduction of higher dimensions of consciousness into our awareness."
~ Lao Tsu (n.d.)

This thesis began with a critique of the school system. It ends with a feeling of liberation. In one sense, it is my final farewell to the 43 years I spent learning in and from the system. In another, it is a springboard toward my next adventure. Although I have no idea where I'm headed, I do believe I've discovered some enduring truths about myself as I sought to solve the mystery, *How did I end up here?* For one, I've realized how quickly and powerfully my mind latches onto information, and then assimilates it accordingly. This is a practice that I would like to let go, as I've been living *in my mind* for most of my life. Now it's time for a different tack.

This brings me to my second *truth*. I am on a spiritual quest. I've actually been on it for much of my adult life as well, which has perhaps been the cause of so much of my internal conflict. Of course, it would be uncharacteristic of me not to have at least one question arise related to this struggle, so here it is: Are *mind* and *spirit* mutually exclusive? In an attempt to answer this, imagine there are two roads, one entitled, "Mind," and the other entitled, "Spirit." Is it possible to arrive at the same destination regardless of which road one chooses? I feel confident in stating that most, if not all, of the Eastern and Indigenous traditions would respond with an emphatic "No." I feel much less certain about the reaction by Western scientists. Personally, I'm going to add my voice to the former group, and thereby assert that it is only through the relinquishing

of the mind that one can fully *be* in the present moment. Thus, I have decided to dedicate the remainder of this dissertation to an attempt at remaining in the present moment while I allow my spiritual *self* to express some departing thoughts.

As I've already shared, directing my attention to spiritual endeavours is something I've been doing for quite a long time, first as a Catholic, then later in personal practice. Over the years, I've noticed great changes in the *spiritual* collective consciousness of the people with whom I've come into contact. Ten years ago, when I spoke about anything to do with spirituality, it was a conversation stopper. Today, I notice that almost everyone is open to listening to thoughts on the topic. And while I realize that may have a lot to do with the people that I choose to engage in conversation, the amount of openness is still significant. One particular influence that may have been at least partly responsible for this change was the auspicious arrival of December 21, 2012, also known as "2012" or "the end of the Mayan calendar."

2012 and the End of the Mayan Calendar

In case you're wondering why I've chosen to bring up the Mayan calendar and the year 2012, I do so for a few reasons. Most importantly, the winter solstice of 2012 had great spiritual significance for many people on the planet, particularly with respect to the ending of a 26,000 year-old calendar cycle. As a result, a multitude of workshops, conferences, and online communities surfaced to address and prepare adherents for the impending *shift* or *doom*, depending on which beliefs you subscribed to. I found myself being drawn to the notion of a collective shift in consciousness, based on the changes I was seeing in those around me. Not to mention, I was curious to find out if such a worldwide transformation in a single event was possible.

Because many of my friends as well as people in the community were interested in 2012 and its potential impact, I felt an increased sense of interconnectedness around

the occasion. One question that was on everybody's mind was how they would be spending what some were calling the day of the Apocalypse. As an aside, I do realize that for many people, this day passed uneventfully just like any other. As for me, I attended a winter solstice ceremony held by a shaman living in my area. Somehow, I intuitively knew that honouring this day in a special way was important for me, and so felt glad to have the opportunity to participate in a sacred event.

Looking back, as I think about how the weeks and months leading up to December 21, 2012, contributed to my doctoral research, I am reminded of the *mind versus spirit* conundrum above, for it was at that time that I came closest to abandoning the endeavour altogether. I really could not see how its completion would advance me spiritually, and so I did not touch the computer for six weeks. Eventually I came to realize, however, that on some higher level, there is a greater purpose for putting this dissertation out into the world, which exists beyond my mind's comprehension. Thankfully, it has been this same *external* force which has been guiding the project to its rightful end. Personally, I acknowledge it as my Higher Self. In my friend's culture, he calls it the Soul, which makes me think of Aristotle, Augustine, and Aquinas. Whatever the name, I would not be writing these final paragraphs without *her*.

Why a *Terrestrial* Worldview?

As I reflect on the overall research process, I am able to highlight the following unexpected yet profound revelations that have emerged:

- While I felt fairly successful linking reflection on critical events to expanded awareness, I learned that the *degree* of expansion was far more difficult to assess.
- There appear to be at least two scientific paradigms that currently exist (Newtonian and quantum), although it is unclear which one has greater influence.

- Once you move beyond the restrictions of the modern, materialist view of science, you discover that there are scientists studying many of my *off-limits* topics, like the paranormal, remote viewing, near-death experiences, UFOs, ETs and life on other planets, etc.
- There are Western scientists who embrace the non-physical and subjective factors in their research.
- According to my investigation, there is far more to our reality, our world, and our universe than we have been led to believe. What remains to be seen is *who* and *why* this information is being kept from us.
- Individuals like His Holiness the Dalai Lama, Mi'kmaq Elder Albert Marshall, David Bohm, Fritjof Capra, Nassim Haramein, and Dean Radin, among a host of others, believe that science can be enriched by taking a pluralist perspective.
- A *Terrestrial* worldview could be the key to the next paradigm shift in science.

These observations effectively sum up the nuggets that I will take away with me from this study. With respect to the last one, however, I'd like to offer a few details regarding the events that prompt me to make this statement. For example, when I originally heard the news that Pluto was losing its *planet* status in 2003, it was the first time I could ever personally recall science recanting their position on anything I had learned in school. So when I found out that the mnemonic phrase we had been taught to remember the order of the planets, "My Very Excellent Mother Just Served Us Nine Pizzas," was being changed to "My Very Excellent Mother Just Served Us Noodles," I was rather perplexed.

To address my confusion and subsequent mistrust, I began proposing to students that what we currently claim to know in science is based on the technology that we possess. Therefore, when the technology changes, likely so will the science. However, in more recent years, I found myself adding a second caveat – that our current knowledge is not only based on technology, but also on our space-time continuum. In other words, should it happen that one day we are no longer limited by the *space* and *time* features of this third-dimensional reality, all bets are off. A case in point is Barbara Bartolomè's near

death experience when she observed the medical staff and her own body as she was floating on the ceiling. I feel certain that there are presently no rational explanations capable of describing such phenomena in scientific terms.

But what does any of this have to do with a *Terrestrial* worldview? Well, let's just suppose that one day, we do come to a place where we have both the technologies and the evidence to support the very *off-limit* science of which I have been speaking. This would mean that we might find ourselves dealing with such things as: life on other planets, alternate universes, parallel dimensions, and so on. Then, one would have to admit that the universe, or should I say *multi-verse*, is far more vast than our present-day conceptualizations indicate. In such a case, our perspective would have to change once we more fully understand our place in the multi-verse as *Terrestrial* beings. In which case, we may want to be a little more cognizant of where we dump our *space trash*, which I understand is becoming quite a concern for space agencies and the future of near-Earth, orbiting vehicles (David, 2009).

Is Science Fiction Becoming Science Fact?

What I suggest above might very well link me more closely to *Star Trek* creator, Gene Roddenberry (1966-1986), than to any person of science. Yet, many of the scientific developments I witness today resemble science fiction more than science fact. Of course, a couple of the accounts I am excited to share may still be heralded as pseudoscience or in some cases, just plain nonsense, but I shall proceed nonetheless to reveal three of the discoveries that I have made over the last year, which reflect my passion for subjects that create cognitive dissonance. Beware: I shall not restrict myself to peer-reviewed reports. (Time to don your tin-foil hats.)

I'll begin with Nobel Laureate, Luc Montagnier, and his team (Montagnier, Aissa, Del Giudice, Lavallee, Tedeschi, & Vitiello, 2011), who claim that DNA in one test tube can

send electromagnetic copies of itself into the water of distant test tubes. Naturally, this assertion has met with an onslaught of scepticism from those who are not yet ready to embrace any notions of *teleportation*. This might explain why Montagnier continues his work in China, and why other scientists who have arrived at similar conclusions are afraid to publish their findings (Interview & Montagnier, 2010). Meanwhile, researchers at the University of Tokyo hope their improved quantum teleportation technique will soon lead to practical applications in quantum communication and quantum computing (Ralph, 2013). As for me, I am open to and intrigued by the possibility of teleportation, which incidentally, can also be linked to other favourite topics of mine, like time travel, wormholes, and of course, "Beam me up, Scotty!"

In a second discovery, I have come across Canadian electrical engineer, W. B. Smith (1964), and his book entitled, *The New Science*. It was written before he died in 1952 (but published posthumously), and contains such complex notions as: we live in a poly-dimensional Universe whose basic particle is toroidal in shape (just as Haramein and Rauscher claim [2005]); and, reality cannot exist without awareness. While I find his scientific information to be very interesting, I am even more fascinated by the declarations he makes. One appears at the beginning of his book: "Assembled by W. B. Smith from data obtained from beings more advanced than we are" (Beckett, 2012b); one, he makes in a declassified Canadian Top Secret document: "Flying saucers are real" (Beckett, 2012a); and one comes from a speech he delivered to a group in Ottawa in 1958 based on his alien contact:

> In science we have an established procedure always to tie a new discovery or observation to that which we already know, even though to do so requires extensive patchwork and perturbation factors to be applied to our existing knowledge to make the new knowledge fit. We invariably assume that the new knowledge must somehow be closely related to the old, and we are most zealous in tying the two together. As a consequence we bend and warp our units of knowledge so that we can fasten them together, whether or not they belong together, until we have fabricated quite a structure, which is almost completely closed on itself.

> Consequently, when we do find knowledge that should, but just won't, fit our structure, we have no alternative but to reject it.
>
> I am informed that science really is much more simple than we imagine, and all the component parts fit together perfectly without any corrections. Possibly we should start over again and reassemble our knowledge in a different pattern, and this time fit the jigsaw puzzle together properly without trimming the pieces. I feel sure that if we were to do this and accept the philosophy on which this new approach must of necessity be based, we can enjoy the technology and the way of life, which is demonstrated to us by the presence of the spacecraft and of our brothers from elsewhere. (Beckett, 2012b)

Apparently Smith and his colleagues also received blueprints for extraterrestrial instruments used by the "Space People," which they were able to construct. Not surprisingly, few people have ever heard of him or these inventions. That seems to be because mainstream scientists instantly respond to such ideas by calling them pseudoscience, quackery, or even lunacy. All Wilbert Smith asks is that we look at the evidence before we jump to conclusions.

Ostracizing anyone who does not practise *acceptable* Western science methods has been going on for as long as I can tell. It may be for this reason that I am especially attracted to learning more about these individuals and their claims, for I have always been in support of the *underdogs*. In this final example, I present former Canadian Minister of National Defence, the Honourable Paul Hellyer, who describes himself as the highest ranking official of the G8 countries to state unequivocally that UFOs do exist (Hellyer, 2013). However, his case is different in that he reiterates these words before the *Citizen Hearing on Disclosure* in Washington DC, as one of over 40 witnesses (including Edgar Mitchell and Stanton Friedman) who testify about various aspects of UFO and extraterrestrial interactions to five former members of the United States Congress (Citizen Hearing on Disclosure, 2013).

During these proceedings, Hellyer also testifies that "the aim of the game is a world government, comprising members of a cabal, who are elected by no one, and

accountable to no one, and according to Mr. Rockefeller, the plan is well advanced" (Mike, 2013). He names the members of the cabal ("the Council on Foreign Relations, the Bilderbergers, and the Trilateral Commission, the international banking cartel, the oil cartel, members of various intelligence organizations, and select members of the military junta"), calling them the shadow government of the Western world. Much of what he shares comes from his book, *Light at the End of the Tunnel: A Survival Plan for the Human Species* (Hellyer, 2010), indicating that he is not afraid to express his controversial ideas publicly. Although a lot of what he says sounds more like conspiracy theories than political truths, I am inclined to take his assertions seriously. Having myself attempted to purchase an electric car last fall, only to be told six months after placing the order that the car had still not been manufactured, I can only wonder about the power of these unknown forces.

Hellyer concludes his testimony with this sentiment, "In a word, we have to become spiritual beings, and practice the one tenet that the world's major religions have in common, that is, *The Golden Rule*" (Mike, 2013). Perhaps this is the very essence of the *Terrestrial* worldview from which all else stems: **Love**, the eternal field that entangles everyone and everything in the Universe. Yet what is the one topic that has been left out of virtually all scientific research? *Love*. Which leads me to my very last question: What would the world look like if *Love* found a place in science? Now how's that for a paradigm flip!

Farewell

On one hand, this journey has expanded my worldview. On the other, my world has shrunk. I have come to believe that the people, the places, and things that I come into direct contact with on a daily basis are *my world*. As a result, I no longer watch television, read the newspaper, or listen to the radio, for they are merely mediated experiences, whose significance and descriptions are determined by others. They don't

reflect my reality, nor how I would want it to be. That is not to say that I don't enjoy exploring the Internet for topics I find engaging, like: raising human consciousness and planetary vibrations, spirituality, meditation, qi, subtle energies, UFOs, ETs, life on other planets, alternate dimensions, parallel realities, the paranormal, dowsing, communication with angels and guides, channeling, reincarnation, ancient mysteries, forbidden archeology, etc. And most of the topics in this dissertation, in fact.

As I write this, a final thought crosses my mind. If one day in the future, or should I say, "in my lifetime," we ever decide to educate students about the science of *these topics*, **THAT** just might be the day I consider returning to teaching.

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Appendix A.

More About the Author

Welcome to my personal adventure, a journey in which I, the protagonist, struggle with life's bigger questions. Originally, it seemed as though the intent of this megalithic task was to offer insight into what I might characterize as my *mid-life crisis* – a time when I was confronted with questions about what I would do with the rest of my life if I left the teaching profession. Only in these last few months has it become clear that I would be better off calling it a *spiritual awakening*, having come to realize that life may be taking place on a grander scale than we perceive during our day-to-day experiences. But I'm getting ahead of myself. Let me back up far enough to provide you with the information needed to understand how this 'shift' in my perception took place.

As a child, I was privileged to grow up in Canada in a white, middle-class, loving family during the '70s – the decade that wasn't really known for anything, in my humble opinion. I was ten years too late for the '60s when hippies flaunted their 'flower power' at Woodstock and music from artists like Bob Dylan, Jimi Hendrix, Aretha Franklin, CCR, Marvin Gaye, Gladys Knight, etc. was at its peak. Darn. Consequently, I spent what I would call an uneventful 13 years in Catholic school in a small, quiet, southern Ontario town not too far from the US border. I was your typical, subservient child: I did everything I was told and believed everything I was taught. Overall, my childhood was a peaceful one and my impression of the world, naïve.

However, as I approached the age of 18, I received a series of wake-up calls and my perspective of the world began to change. Let me dive right in and share the first of these significant events, which I detail in the journal entry below:

> *While it may initially seem inconsequential, I shall begin by sharing that I grew up in what I would call a strict Catholic household. I use the word 'strict' because I don't know how else to explain the fact that while looking around the room of my grade 12 religion class, it became painfully clear that I was possibly the only student who believed that Jonah was* ***actually*** *swallowed by a whale. What was worse, I was the only one to publicly admit it. I shall offer a few reasons for this naïveté. Perhaps the most important was that at a very young age, I knew that my life would be easier if I went along with my parents and their views than to oppose them.*
>
> *As a result, when my dad reinforced the notion that faith meant not needing to question but rather to accept completely, I embraced his teachings wholeheartedly. The final and clinching argument was, "if God wanted Jonah to spend three days in a whale and live to tell about it, it was certainly within His power to do so." (As you will see in many of the journal entries, my disposition to accept and not challenge is called into question at a number of intersections in my life.) I have often been described as naïve, and certainly this event was the first of many.*
>
> *But perhaps more powerful than a challenge to my accepting nature, this event initiated the break between the world I saw under my parents' care and the one I would now begin to see as an independent person. Because it took place at school, it somehow pitted my parents' teachings against the universally accepted doctrine of 'society' (or at least that's how I perceived it at the time). After that, my view of my parents and all that I'd been taught was called into question and I was anxious to get out in the big, new world and discover what other things I had been sheltered from.*
>
> *Sadly, for many years to follow, I wondered how much my parents really understood about the world. In my young mind, they had much to learn. How could everyone else in the class know that*

> *Jonah wasn't swallowed by a whale? I began to describe my upbringing to others as the 'glass house' my parents kept me in, not letting me see the world as it was, but in their contrived, distorted way. In many people's opinions, I was at an advanced age (19) before I started to see things through my own eyes and not through those of my parents. Interestingly, it would be another 25 years before I would hold the education system up to the same scrutiny.*
>
> (entitled, *Jonah and the Whale,* found in Appendix B)

As I reread this account, I can recall the strong feelings of confusion. I had felt so secure in my religious beliefs that I wasn't aware there were other perspectives than mine. I know. How horribly naïve. And you might be thinking that it takes a lot of courage to publicly disclose such ignorance. Other than the fact that I'll be lucky if more than a handful of people read my dissertation, I believe this personal information might provide some insight into why I act and react the way I do.

Soon after the first of my wake-up calls, I joined the Canadian Armed Forces at the suggestion of my dad, in order to have the financial means to attend university. This was one very large step propelling me into the world that lay beyond my parents' reach. And to increase the distance between us even further, within the year I found myself studying science and living on campus at McMaster University, four hours from home. Aside from bi-weekly calls, contact with my parents went from daily to holidays, namely Thanksgiving, Christmas, and Spring Break. I was clearly on my own now and it was up to me to determine the person I would become.

After I left home, I realized that my parents had nurtured in me two very important gifts: *a strong sense of self* and *faith*. Armed with these, I could do anything I set my mind to and find deep meaning along the way. These qualities come into play during the research project, but what is worth mentioning now is the fact that not even these wonderful attributes could have prepared me for the fallout of choosing the sciences as an area of study while possessing strong Catholic beliefs. This conflict can be summed up by 'wake-up call number 2':

> *I hadn't really thought choosing science as a major in university would be problematic. But then again, I never learned about evolution in Catholic school. It wasn't until my first year biology professor spoke about a fellow by the name of Darwin that my religious beliefs were challenged for a second time. From what I could tell looking around the auditorium filled with 300 science students, evolution was an accepted theory. So if I wanted to join them, I'd have to accept that humans evolved from apes – full stop.*
>
> *By the end of the semester, I had figured out a way to continue being a good Catholic and a science major too. Just as I had learned that the story, 'Jonah and the whale', might not be true, then maybe neither was God's one-week, creation timeline. What if figuratively 'days' in the Bible lasted thousands of years? And Adam's ancestors were Neanderthals? That might also explain where those other people came from who would later marry Adam's descendants. With this new interpretation, I could safely accept the teachings of science while freeing myself from the guilt of thinking I had turned my back on the Church.*
>
> *In retrospect, this negotiation may have been the most significant of all the critical events in my past. It was the first time I allowed my logic and rationale to override my faith. Not only that, I manipulated this notion of figurative Bible stories to suit my own need – acceptance of the science canon. For some reason I believed that if science and religion were mutually exclusive, I would be forced to withdraw from the science program. I remember thinking at the time that resolving the relationship between the two in my own mind had been a crucial step.*
>
> (entitled, *Learning About Evolution,* found in Appendix B)

Twenty-eight years later, I can say that this event not only liberated me from the indoctrination of the Church, it gave me the freedom to challenge everything science or religion had ever told me to accept as Truth. In essence, it opened the door to an expanding awareness regarding how much I had to learn about

life, about the foundations of my beliefs and values, and especially about the world in which I lived. In the years that followed, I continued to ask myself how science and religion might somehow see eye to eye and was determined to find an answer. Much to my parents' chagrin, this search only led to my leaving the Catholic Church at the age of 30 and abandoning the task altogether.

That is, I abandoned the task of reconciling science and religion. But in 2008, I awoke to a new purpose – reuniting science and *spirit*, as illustrated in this journal entry:

> *As I mentioned earlier, I went to Catholic schools throughout my entire K-13 education. This also played a critical role during my first year of university when I struggled with the 'science versus religion' question, causing me months of personal anguish, to the point where I even questioned my future in science. So you might be able to imagine my feelings of surprise and disillusionment when I learned that until the period of Enlightenment in the 17th century, science was actually focused on discovering nature's 'secrets', which was also perceived as a way to get closer to God.*
>
> *What? How could this be? Until 400 years ago, science and religion were NOT mutually exclusive? If that's true, could it mean that the introduction of a rational, objective view of present-day science started out as someone's idea? This new possibility had strong implications for both my view of science and science education. Although, as a side note, I was no longer the young, naïve girl I had once been and few things surprised me the way they once did. But before I speak about these implications, let me first talk about the other factors that have contributed to my personal view of the intersection between science and spirit.*
>
> *First, having lived in a community where 50% of the population were First Nations and later teaching First Nations students in my classroom, I have come to learn about, respect and embrace a different conception of science than what I had been taught in school. When I picked up Gregory Cajéte's book, Native Science, I recall how much its content resonated with me. He referred to modern scientists as 'younger brothers' to signify how difficult it was and is for them to understand Indigenous epistemologies that come wrapped in metaphors and stories. This made me wonder if scientists predating the Enlightenment might've been more open to this way of thinking.*
>
> *Second, I discovered that the science of quantum mechanics and epi-genetics made clear the inability of rational objectivism to explain various phenomena. Not to mention, those explanations and technologies are restricted to the current space–time continuum. In a matter of months, I realized that the more I expanded my research, the more I was coming full circle, from the 'evolution' question in first-year biology to a more spiritual conception of science. Apparently more and more scientists have been doing the same.*
>
> *But what about the implications for science education? Why was it not advancing? In other words, if Planck won the Nobel Prize in Physics for quantum theory in 1918, then why did I not learn about it in the '80s? But even more disturbing, if Tesla came up with 278 patents which included the invention of the radio, alternating current, x-ray tubes and free energy, why has every student in North America heard of Thomas Edison yet few have ever heard of Tesla? Clearly there are other powers at work in educating our students about science.*
>
> *Let's now turn to my role as a science educator and how my beliefs about the potential merge between science and spirit might fit. Say, for example, I felt justified in incorporating spiritual elements into the science curriculum. Our society insists that there are some topics that just don't have a place in the public school classroom, spirituality being one of them. Furthermore, it will likely still be years, decades even, before the scientific community at large acknowledges, let alone supports the notion that science and spirituality intersect. Certainly, many would find my ideas heretical.*
>
> (entitled, *Spirituality and Science*, found in Appendix B)

Alas, you can see where those original ideals regarding a shift in perception were budding. Since the moment I learned that science and religion might once have shared the common goal of finding Truth, I have been conflicted. Not until this summer, did I realize what the implications for these feelings were. When I finally confronted the ambivalence I was feeling toward my doctoral research and my growing desire to call it quits, I realized that in order for me to continue with any vigour, I had to reframe how I approached my original plan.

Somehow, I knew the solution lied in addressing science and spirit. So, I departed from the initial, unfulfilling path and found a way to incorporate consciousness and spiritual pursuits into the endeavour. Of course, this opened up a whole new can of worms since my science education did not prepare me for such a task. Thankfully, I was not the first to make such an attempt and so rode joyfully on the coattails of others, including Kristof Koch, Lynne McTaggart, Thomas Campbell, Bruce Lipton, and David Hawkins, among others.

As you depart, I wish to leave you with some concluding remarks: I am very passionate about science and science education, but particularly enthralled with the exploration of science that pushes its frontiers toward spirituality. From what I have found, there are a growing number of individuals who share this interest, many of whom are scientists: Newton, Heisenberg, Schrodinger, Bohr, Einstein, Tesla, Mitchell, Bohm, and Tart, adding to the list of those mentioned above. I have no doubt that future sciences involving the paranormal, time travel, other dimensions, ETs, studies in consciousness, reality and more, all have something to do with spirituality. My hope is that by the conclusion of this dissertation, I have successfully proposed how they all might be interconnected.

Appendix B.

Journal Entries

Jonah and the Whale

While it may initially seem inconsequential, I shall begin by sharing that I grew up in what I would call a strict Catholic household. I use the word 'strict' because I don't know how else to explain the fact that while looking around the room of my grade 12 religion class, it became painfully clear that I was possibly the only student who believed that Jonah was **actually** swallowed by a whale. What was worse, I was the only one to publicly admit it. I shall offer a few reasons for this naïveté. Perhaps the most important was that at a very young age, I knew that my life would be easier if I went along with my parents and their views than to oppose them.

As a result, when my dad reinforced the notion that faith meant not needing to question but rather to accept completely, I embraced his teachings wholeheartedly. The final and clinching argument was, "if God wanted Jonah to spend three days in a whale and live to tell about it, it was certainly within His power to do so." (As you will see in many of the journal entries, my disposition to accept and not challenge is called into question at a number of intersections in my life.) I have often been described as naïve, and certainly this event was the first of many.

But perhaps more powerful than a challenge to my accepting nature, this event initiated the break between the world I saw under my parents' care and the one I would now begin to see as an independent person. Because it took place at school, it somehow pitted my parents' teachings against the universally accepted doctrine of 'society' (or at least that's how I perceived it at the time). After that, my view of my parents and all that I'd been taught was called into question and I was anxious to get out in the big, new world and discover what other things I had been sheltered from.

Sadly, for many years to follow, I wondered how much my parents really understood about the world. In my young mind, they had much to learn. How could everyone else in the class know that Jonah wasn't swallowed by a whale? I began to describe my upbringing to others as the 'glass house' my parents kept me in, not letting me see the world as it was, but in their contrived, distorted way. In many people's opinions, I was at an advanced age (19) before I started to see things through my own eyes and not through those of my parents.' Interestingly, it would be another 25 years before I would hold the education system up to the same scrutiny.

Learning About Evolution

I hadn't really thought choosing science as a major in university would be problematic. But then again, I never learned about evolution in Catholic school. It wasn't until my first year biology professor spoke about a fellow by the name of Darwin that my religious beliefs were challenged for a second time. From what I could tell looking around the auditorium filled with 300 science students, evolution was an accepted theory. So if I wanted to join them, I'd have to accept that humans evolved from apes – full stop.

By the end of the semester, I had figured out a way to continue being a good Catholic and a science major too. Just as I had learned that the story, ' Jonah and the whale', might not be true, then maybe neither was God's one-week, creation timeline. What if figuratively 'days' in the Bible lasted thousands of years? And Adam's ancestors were Neanderthals? That might also explain where those other people came from

who would later marry Adam's descendants. With this new interpretation, I could safely accept the teachings of science while freeing myself from the guilt of thinking I had turned my back on the Church.

In retrospect, this negotiation may have been the most significant of all the critical events in my past. It was the first time I allowed my logic and rationale to override my faith. Not only that, I manipulated this notion of figurative Bible stories to suit my own need – acceptance of the science canon. For some reason I believed that if science and religion were mutually exclusive, I would be forced to withdraw from the science program. I remember thinking at the time that resolving the relationship between the two in my own mind had been a crucial step.

Surviving First-Year Chemistry

When I first started University, I found several aspects of the courses overwhelming. Certainly one challenge was to read and comprehend five super-thick compendiums for five science and math courses (biology, chemistry, physics, algebra and calculus) in the span of two semesters. Another was to sit in auditoriums with three or four hundred other students and follow along with the professor while taking notes at breakneck speeds. Unfortunately it wasn't until much later that I learned I would have been far more successful if I had sat at the front and simply listened.

But the experience that created the most anguish for me the first year was writing up 'chem labs' (chemistry lab reports). Every week I would painstakingly carry out the steps of the chemistry experiment – measuring accurately, recording observations with great detail, and asking questions whenever I was unsure about anything. Then I would compose the piece: purpose, apparatus, method, observations, conclusions, giving an account of my findings as clearly as possible. Solutes, solvents, percentages, molarity, temperatures, rates – I blended them masterfully into a comprehensive document… or so I thought.

So, when I got my first write-up back from the tutor, as you might imagine I was very excited to see how well I measured up in this new environment. However, when I opened to the page revealing a miserable 5.5 out of 10, I was certain I had someone else's notebook. Sadly my name appeared on the cover and as I double- and triple-checked my score in disbelief, the reality of the situation started sinking in. How could this be? Clearly my diligent efforts and high school training had not prepared me for the rigours of writing University chem labs. "Don't worry," I told myself. "This is only the first of many."

Now that I knew the high standard that was required of me, I set out to be even more careful with my data collection and ask more questions to ensure I was on the right path. I was meticulous with the procedures and even compared my findings with others. These results would be different and I would look back on the first score as a testament to my being 'green', inexperienced, and naïve.

What? This can't be! 5 out of 10? Was the universe playing some kind of trick on me? Was I lulled into thinking that I was suited for the sciences by my high school teachers? I had dreamt of becoming a grade 12 chemistry teacher yet now those dreams were evaporating. With a third score of 6 out of 10, I started to seriously question whether or not I even belonged here.

Just when it seemed I might never achieve more than a minimal passing grade, I was given access to one of the previous year's notebooks containing those highly valued chem labs. I was also told that these labs were copied from the labs the year before, which were copied from the year before that, and so on and so on. Apparently the chemistry experiments had not changed by so much as one word in a very long time. And when I read through the near–perfect notes, all I could think was, "this wasn't even part of the experiment. How did anyone ever come up with this?" Nonetheless, marks of 9, 9.5 and 10 soon adorned my papers.

Looking back, the message I took away from this experience was not a positive one. It was clear that the institution was not interested in the authentic results I collected during the experiments. Consequently I

was not empowered to make sense of them via my own observations and conclusions. Instead, I learned that I must arrive at the same set of data and give the same explanations as the Authority if I was going to achieve respectable results. Unfortunately for me, the chem lab write-ups with the highest scores always contained elements that seemed totally foreign and arbitrary. This made this whole process feel like a game of chance where I was most definitely the loser.

So what is a first-year university student to do? What would you do? An uncomfortable predicament to be sure.

Getting Into Education

To enter a teacher-training program in Ontario in the late eighties, you were allowed to apply to a maximum of three universities each year (although I'm not sure why or if that's still the practice today). At the time, teaching was a very popular career choice and more difficult to enter than med school or law school. Consequently, I was not the one in twenty that was chosen in either the first or second year I applied. As a result, I decided to expand my search to include nearly every university in Canada. When the University of Saskatchewan sent me their acceptance letter, I ceased pursuing all other programs (which was getting costly) and moved west.

This decision had several significant impacts on my life. First, I was a student in a burgeoning French immersion program that only had 22 students in its first year. Second, as I would learn well into the second month of classes, there were no courses directed at teaching high school. But perhaps the biggest shock of all came when I was assigned to a grade 4 class for my practicum in a small town two hours north of Saskatoon, the city in which I had just begun to settle.

Since I had completed a Bachelor's degree in science with the dream of teaching grade 12 Chemistry, I was in a serious state of disequilibrium. Not only was I one of two students who had to relocate (and leave my new, prairie-boy fiancé), I had to work with 'little people' in an elementary school for four months. Clearly someone had made a huge mistake! I told them from the outset that I was going to teach grade 12 Chemistry. How could grade 12 Chemistry possibly be confused with grade four?

And so it was. For the first two weeks of my practicum, I couldn't get over how little the students were, runny noses and all. "Ms. Teed, can you help me do up my zipper?" It was like I found myself in some alternate universe. Until of course, I got my first drawing. All you elementary teachers know exactly what I'm talking about. "Your the best" with the drawing of a flower... and a picture of a horse with "love Alicia." Soon I was getting drawings every other day. How could you not love these wonderful, little, trusting human beings? I was hooked.

There was another critical event that took place during this relocation, but it would be years before its influences would show up significantly in my teaching. That was the fact that I lived in a town whose population was 50% First Nations. I had grown up studying about Indians - the Ojibway, Onandaga and Algonquin - but I never before met any. (Please note that I realize that statement isn't at all true, having recently learned that my best friend is Métis but never told me. And you have likely gathered from my earlier stories, I grew up extremely sheltered and naïve.) Now, I was experiencing firsthand the First Nations dances, costumes and stories of a cultural history I knew only from books. It was the beginning of an education that would have a powerful impact on my view of schooling later in my career (as you will see in another story).

Suburbia Elementary

Despite the fact that I had always wanted to be a high school chemistry teacher, ever since I had done my practicum in grade four I had thought about returning. So, after three years of teaching junior high, I headed back to an elementary classroom to see if it was a better fit. What I was about to discover was that

neither my schooling nor my previous years of teaching had prepared me for the most unique experience of my career.

During my 5th year of teaching, I was presented with some interesting challenges in a grade 4/5 classroom. It was the first time I had been exposed to encopresis, meaning "the voluntary or involuntary passage of stools in a child who has been toilet trained (typically over age 4), which causes the soiling of clothes" (PubMed Health, http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0002537/). What it meant for the students and me was that at some unforeseeable moment, when some unknown event(s) triggered Alex's feeling of insecurity, everyone else's ability to handle that unmistakable smell was tested. For fear that one of the students, or even worse, me, might not be able to keep down our lunch, I would move the class to an alternate location if Alex refused to go to the washroom promptly and take care of business.

Equally as new to me were the behaviours of Audrey. She especially liked to draw on her face with markers. Unbeknownst to me, a directive from the teacher meant little to her. So on the second day that she decorated her face in orange, blue and red, I removed all of the writing materials from her desk. Needless to say, that wasn't the last time Audrey drew on her face, nor was it ever determined how she continued to procure the markers.

Other things Audrey liked to do included singing while I was speaking, circulating the classroom while I would explain activities, fiddling with anything she could get her hands on inside her desk, and taking 15-minute strolls in the hallway during supposed visits to the washroom (well, it only took me a few days to address that behaviour). It wasn't until later that I heard she was the daughter of two parents with schizophrenia. Apparently, children cannot be diagnosed with schizophrenia until they reach adolescence. Unfortunately this meant she did not qualify for any special support, which meant neither did I.

Students with less challenging situations included a girl who had a limited ability to communicate, offering one or two single-syllable words and only able to write her first name, as well as two students who arrived straight from Mexico unable to speak a word of English. Also in the mix was a boy with Asperger's syndrome and two students who required learning assistance.

First and foremost to me, these and all my students were wonderful human beings whom I loved dearly. However, the combination of needs in a class of 32 with the task of providing both grade 4 and 5 curricula was well beyond my qualifications, and on some days, well beyond my abilities. It was at this point that I had to truly ask myself, "Was I cut out to be a teacher?" I loved working with the students, yet there were times when I felt that I was doing little more than babysitting and I struggled to see how I was benefitting them. They were all so trusting, counting on me to prepare them for the next year. I could only hope that in some small way I was making a difference.

"I support a student's right to fail"

Just like many new teachers, when I first started teaching I had naïve expectations and lofty goals. So when veteran teachers complained about their struggles with students, I would tell myself, "That will not happen to me." I felt quite immune to the negative commentary that occasionally took place in the staff room. There was little they could say that would penetrate my thick layer of positive thinking and blind ambition.

However, one day during a conversation with a colleague whom I greatly respected, he said the oddest thing: "I support a student's right to fail." At first, I thought I hadn't heard him correctly. "A student's right to fail..." I turned the words over curiously in my mind. What could he possibly mean? So I asked for clarification. I wasn't at all prepared for his response.

One thing my friend claimed was disappearing from the school system was a student's chance to fail. According to him, we were passing kids on even if they didn't possess the skills they needed to move

forward. As a result, they were learning that perseverance and effort didn't really matter, and for some this meant trying less and less. "Not to worry," the system had taught them. "I'll be passed on anyway."

Unfortunately, says my colleague, students are missing out on a valuable learning opportunity – failure. Then he asked me, "Have you learned more about life, yourself and your abilities from your successes or your failures?" He made a great point. Originally my Susie Sunshine self wanted to oppose his notion of failing students. Wasn't it the teacher's role to ensure that all students succeeded? But with this question, he had forced me to consider the importance of not succeeding. "Take a look at all the great failures – Coca-Cola, penicillin, the birth control pill. Not to mention, the power of failure to push people beyond what they believe their limits to be."

It would be a long time before I would fully grasp the profundity of my friend's statement. But over time I have come to agree with him. When we don't allow students to fail as well as succeed, they are left in a kind of holding pattern. And if they never confront the potential failure, they will always wonder if they could have overcome it. I know this from personal experience because I was allowed to quit taking piano lessons when it became too difficult. Only now as an adult do I wonder if I might've become a pianist if my parents didn't let me quit.

My most recent experience that encapsulates this belief happened during my final year of teaching. One of my students had struggled through the separation of his parents. Emotionally, it was difficult to watch him respond by refusing to do school work. Perhaps it would have been more sympathetic to overlook his present performance and assess him according to his past successes. However, my response was to tell him that I supported his right to do nothing, that I would honour his decision and I would not try to force him to do the assignment. And I meant it with the most love and respect. However, he should know that the consequences would likely lead to a failing grade. When he decided that the work was worth doing, he proved to himself and to me that he was capable of it. And I can't help but think he also learned that his success in school played an important role in the challenges he was having in his personal life.

Being an Auditory Learner

I had been teaching in the school system for a number of years before I attended a workshop in which the presenter stated that roughly 60% of the population are visual learners and the other 40% are auditory. I found this to be a curious statistic and decided to investigate further, especially since at the time I was not entirely sure which I was, visual or auditory. Here's what I discovered:

- visual learners take in information through their eyes, auditory through their ears
- visual learners will more likely absorb information by reading than auditory learners
- auditory learners would rather be explained things than read about them

Next I started conducting personal experiments, the most profound of which was to listen to an audio book. It was one magical day when a whole new world opened up through my ears. Of course, it was not revolutionary to realize that I enjoyed listening to presentations and hated reading, but now I had a whole new level of awareness – I actually process information I take in through my ears far better than through my eyes. This would explain how I did so well in elementary school, picking up concepts from the teacher's instructions as opposed to the pain of reading and writing the homework.

Not only did this realization have a powerful impact on me, it also had implications for my teaching. For example, I began giving students the chance to tape-record assignments, to give oral presentations instead of written, and to carry out tests with me in person, more like an interview. As a result, I saw sides of students I never saw before and can recall on numerous occasions thinking, "so you do understand this." Students whom I had misjudged as not comprehending the material were just being mis-tested and

hence, misdiagnosed. Knowing what I knew now, it seemed like an injustice not to find the way each student learned best.

Naturally, I embraced the work of Howard Gardner and his notion of multiple intelligences when I found out about it a few years later. His theory seemed to capture what I had been observing in my classroom – that we possess ALL of the intelligences (linguistic, logical/mathematical, musical, kinaesthetic, spatial, interpersonal, intrapersonal, naturalist, existential) to varying degrees. What I particularly loved about this was that we could actually increase any of our intelligences with prolonged exposure and practice. In fact, if I asked the musical students to come up with a rap song about a science concept, they could recall the information with just about 100% success.

Overall, I felt like I was significantly improving my teaching. Whenever I saw a student struggle, I knew that I had to figure out how to present the information in a way that matched one of her/his stronger intelligences. Yet, looking back I can see how this contributed to a more profound sense of inadequacy on my part. I read once that when teachers around the world were surveyed about the trials they face in the classroom, an overwhelming number of respondents (over 90%) stated 'meeting the needs of all the diverse learners' was the greatest challenge of all. This definitely captured the way I was feeling, especially toward the end of my teaching career.

'*Mindwalk*' by Bernt Capra

Every once in a very long while, you watch a movie that touches you deeply. So deep in fact that you have to go out and buy it because you know you will need to see it another three or 10 more times before you've fully processed it. In my case, I had the great fortune to have a professor who showed the movie, *Mindwalk*, during a Masters class. Little did he know, there would be far-reaching repercussions for me and the way I would perceive science from that moment on.

In case you haven't seen the movie, I'll try to summarize it briefly enough that you will get a sense of the story but vaguely enough that you may be moved to see it yourself (although you'll have to find a video store that has a diverse film collection and a VCR, since unfortunately it does not exist in DVD format). It's set on a medieval island in France where a conversation between 3 people – a poet, a politician and a physicist - takes place. All three are experiencing a personal life crisis on a journey to self-discovery. I shall only briefly mention the physicist, who is trying to come to terms with the fact that her invention of laser technology is being used by the military as a weapon. While it was not her intent to create something that could be used to hurt others, she insists that she must be accountable for bringing into existence such a device, charging that scientists have an ethical responsibility to humanity for their interventions.

By the end of the film, I was somehow changed, or my perception of science had changed. The screenwriter had masterfully detailed an association to science I had never heard before – ethics. I had always believed science was pure, measurable and contestable, making it immune to outside judgments. Now, I began to wonder what it would have been like if I had had a science teacher that brought up such ideas as systems thinking, or asked us about the possible internal conflict that Oppenheimer might have experienced when his application of fission was later used in a bomb killing thousands of people, or told us about Lise Meitner, who was part of the team that discovered nuclear fission but was overlooked when the Nobel prizes were given to her colleagues. Would I have perceived science differently?

Later I would learn that the filmmaker, Bernt Capra, had based the movie, *Mindwalk*, on his brother Fritjof's book, *The Turning Point*. I discovered this quite by accident when my friend and colleague recommended I read the book, Web of Life, by the same author. This book resonated with me so strongly, I marked it with highlighter and Post-it notes from cover to cover. It also led me to *The Turning Point* and a deeper understanding of 'systems thinking', a concept introduced in the movie that would become the foundation on which I would base the central theme of the university courses I would teach a number of years later.

Thanks to Fritjof Capra and his writing about systems thinking, I developed a new love and appreciation for science. Somehow this notion of reversing the way we currently look at the world, dissecting its parts and looking for smaller and smaller particles (molecules, atoms, subatomic particles, etc.), made perfect sense to me. It seemed logical that the traditional paradigm was limiting, as evident in this example from the movie: If you give a patient medicine for an ulcer but fail to determine what caused the ulcer in the first place, you only come up with a short-term solution. However, if you take a step back and view the ulcer as a symptom of the whole human being, then you might consider her or his eating habits, physical activity, work-related stress, etc. This logic was too strong not to give it serious consideration.

Once I expanded my conception of science, it became even more alive and exciting to me. I began to see new possibilities in the way I explained science concepts both for myself and for my students. Science is now dynamic, creative and personal. Let me explain why. For so long, I believed that I was an outside observer of science; learning, memorizing and relaying facts that had been discovered by all the great scientists–Newton, Descartes, Darwin, Curie, Watson, Crick and so on.

Now I saw myself as a participant, asking questions, inventing explanations, testing theories, and putting puzzle pieces together. Aside: I realize that scientists and science educators reading this entry could say that science has always been exactly what I'm now describing – that it was *I* who had limited it. To this, I have two responses: 1) mine may have been one isolated case of an individual who mistakenly interpreted the information taught to her, which caused her to arrive at such limiting beliefs. To that, I say: "Alas, these were steps along my path." However, 2) as evidence that this is not a unique perspective, I offer the attitudes of countless science candidate-teachers, who have arrived in my classes over the last decade and who have been uncomfortable, resistant, and in some cases even opposed to the idea that science is a growing, changing body of knowledge and experiences. Let me conclude with this thought: As our technology changes, so do our explanations. Yesterday, Pluto was a planet. Today it isn't.

Spirituality and Science

As I mentioned earlier, I went to Catholic schools throughout my entire K-13 education. This also played a critical role during my first year of university when I struggled with the 'science versus religion' question, causing me months of personal anguish, to the point where I even questioned my future in science. So you might be able to imagine my surprise and feelings of disillusionment when I learned that until the period of Enlightenment in the 17th century, science was actually focused on discovering the 'secrets' of nature, which was also perceived as getting closer to God.

What? How could this be? Until 400 years ago, science and religion were NOT mutually exclusive? If that's true, could it mean that the introduction of a rational, objective view of present-day science started out as someone's idea? This new possibility had strong implications for both my view of science and science education. Although, as a side note, I was no longer the young, naïve girl I had once been and few things surprised me the way they once did. But before I speak about these implications, let me first talk about the other factors that have contributed to my personal view of the intersection between science and spirit.

First, having lived in a community where 50% of the population were First Nations and later teaching First Nations students in my classroom, I have come to learn about, respect and embrace a different conception of science than what I had been taught in school. When I picked up Gregory Cajéte's book, Native Science, I recall how much its content resonated with me. He referred to modern scientists as 'younger brothers' to signify how difficult it was and is for them to understand Indigenous epistemologies that come wrapped in metaphors and stories. This made me wonder if scientists predating the Enlightenment might've been more open to this way of thinking.

Second, I discovered that the science of quantum mechanics and epi-genetics made clear the inability of rational objectivism to explain various phenomena. Not to mention, those explanations and technologies are restricted to the current space–time continuum. In a matter of months, I realized that the more I

expanded my research, the more I was coming full circle, from the 'evolution' question in first-year biology to a more spiritual conception of science. Apparently more and more scientists have been doing the same.

But what about the implications for science education? Why was it not advancing? In other words, if Planck won the Nobel Prize in Physics for quantum theory in 1918, then why did I not learn about it in the '80s? But even more disturbing, if Tesla came up with 278 patents which included the invention of the radio, alternating current, x-ray tubes and free energy, why has every student in North America heard of Thomas Edison yet few have ever heard of Tesla? Clearly there are other powers at work in educating our students about science.

Let's now turn to my role as a science educator and how my beliefs about the potential merge between science and spirit might fit. Say, for example, I felt justified in incorporating spiritual elements into the science curriculum. Our society insists that there are some topics that just don't have a place in the public school classroom, spirituality being one of them. Furthermore, it will likely still be years, decades even, before the scientific community at large acknowledges, let alone supports the notion that science and spirituality intersect. Certainly, many would find my ideas heretical.

The Importance of Being Outside

Reading about the history of education during my doctoral courses was having a compounding effect on my view of teaching. It seemed the more I learned, the more disillusioned I became. For example, learning about the factory model further amplified the dissatisfaction I had with the large number of students in one class. Each child should have benefited from my individual attention but there were 30 of them and only one of me. And when I found out that the physical size of a school is determined by multiplying the number of students by something like 3 feet square, I couldn't help but see the desks as tiny 'zones of confinement' in which children must spend hours at a time. How else to disempower students than to sit them in isolation and restrict them from movement or the protection of others?

But the greatest frustration I had during my final year of teaching elementary school was regarding the lack of physical activity and time spent outdoors by today's young people. Somewhere along the way, our children had gone from masters of play and creativity to 'plugging in.' As stated by a boy in Richard Louv's book, *Last Child in the Woods*, "I like to play indoors because that's where all the electrical outlets are." And sadly, it seems there is little our schools can do about it. In my case, our school had to share one gym between 16 classes, which meant two physical education classes per week. Combine that with recess, lunch and an initiative to include 20 minutes of daily physical activity during class time and you still get many children with a minimal level of exercise... a recipe for obesity.

Instead of accepting these apparent limitations, I started moving further away from covering the curriculum and spending more time outdoors with my students. Initially, I took them outside for lessons, whether it be to measure the playground for math or to share weather projects for science. After a while I ran out of legitimate curriculum links to the outdoors but we continued to go anyway. Toward the end of the school year, students could earn free time outside of our class portable when they completed certain tasks.

As the school year was drawing to a close, other students and teachers started to question why my class was spending so much time outside. At this point, I could honestly say my beliefs about physical activity were overriding the job I was hired to do. It was then that I realized I could no longer be what I called a 'soldier in the system.' I began to oppose so many aspects of the system, I felt that I could no longer prepare students for their journey through it. I could imagine what the teacher would say next year. "Did you guys do any work at all?" It was not long before I felt compelled to take myself out of the system.

Appendix C.

Emails Sent to Participants

First Email

Hi [Participant's name],

It's official. The ethics committee at Simon Fraser University is allowing me to proceed with the data collection of my doctoral research. So that means I can continue with the next steps, which are:

1. to ask for your consent

I've attached the consent form to this email. If you've read it and you still agree to participate, please return the completed form to me at your earliest convenience. If you prefer, you can print the consent form and mail it to me at my home address.

2. to book a time to view and respond to videos

You will need to block out one hour of time and be able to Skype (ideally). We can begin as early as next Monday, August 22nd. Please indicate your dates and times of availability and I will let you know what works for both of us.

Please tell me:

• what you would like for a pseudonym (a person's name that maintains your anonymity) that will represent you in the research

• dates and times you would be available for an hour to view the video(s) and converse with me afterward (one in August/September and one in October)

• if you have Skype - if not, do you have access to a microphone for your computer? Don't worry. We can make alternative arrangements if you've said no to both.

Again, thank you so much for contributing to the success of my doctoral research. I greatly appreciate it.

Cheers,

Susan =)

Second Email

Hi [Participant's name],

Well, I'm finally getting back on track with my research and ready to move to the next stage: the experiment. I must thank you again for agreeing to participate. So here is what I am asking you to do. (Immediate actions from you are in red below.)

1. Read the 5 descriptions (at the end of this email)

Please read the descriptions below of 5 reflections that I have written about my journey through the education system. When we get together, I will explain the significance of these stories but only after you have answered my questions. This is so your responses are not coloured by what I will tell you.

2. Make your selection and explain why you chose it

Please pick any one of the stories you feel drawn to and it will become the foundation for our first meeting. Once you have made your selection, please tell me which one you've chosen in your reply email. In a sentence or two, also explain what prompted you to choose this story.

3. Arrange a time to get together

Next we will need to arrange a time to get together, either in person or virtually, to conduct the interview (#4 below). Please propose some times that you are free over the next 2 weeks. I will need an hour of your time in total. Once I hear from you, I will let you know which times work best on my end.

4. Conduct the interview

a) At the time we agree to meet, I will send you a link to a video in which I tell you the story you selected above along with a few questions [Detailed in "Initial Interview (Online Form)" below]. I will then wait 20 minutes for you to view the video and answer the questions independently. I ask that you record your answers so that you can send them to me, either by snail mail or email after our meeting, as this will become part of my data.

b) When I contact you (by phone or by Skype), I will ask a few subsequent questions about your response to the video. I shall be recording this conversation for later review and inclusion in my research. I anticipate the whole process should take no more than an hour.

5. Repeat the experiment

Approximately 6 weeks after we finish step 4, I will contact you again to carry out step 5. With your permission, we will repeat the steps above. However, in the meantime, I will be reading a book that may influence some changes in the procedure. I am not sure what those changes will be because I have not yet read the book. But I can say that I anticipate our second meeting to be no longer than one hour and involve your responses to a second story. (As you can see, this will be an interesting experience for me as well.)

Please don't hesitate to send along any questions or concerns. Otherwise, I ask that you carry out part 1, 2 and 3 at your earliest convenience. I look forward to hearing from you.

Cheers,

Susan ☺

Jonah and the Whale: In this reflection, I recall that fateful day when I learned the difference between *literal* and *figurative* in Grade 12 religion class. I was attending a Catholic high school and quickly discovered how naïve I really was.

Surviving First-Year Chemistry: As a first-year university student studying sciences, I quickly learned the importance of 'regurgitating' in this ethical dilemma.

Learning About Evolution: As a practising Catholic who never believed in evolution, I was confronted with the question, "Can I continue in the sciences if I don't support this belief?" during my first year of university.

Getting into Education: In the eighties, getting into education in Ontario was harder than getting into law school or med school. I suppose it was sheer tenacity and perseverance that earned me a spot at U of S in Saskatoon.

"I support a student's right to fail": When a fellow teacher first spoke the words, "I support a student's right to fail," I was sure I heard wrong. But I have come to understand the significance and importance of this statement.

Initial Interview (Online Form)

Please enter your first name and your chosen pseudonym (the name you choose to protect your identity in the research).

Q1. What memories or emotions did this story trigger for you? Please describe. If none are triggered, please type N/A and proceed to the next question.

Q2a. Can you think of a time in your life when failure played a significant role? If so, please describe. If not OR if you've already described this in question 1, please type N/A and proceed to the next question.

Q2b. How did you cope with the failure? (If you answered N/A above, how do you cope with failure?)

Q3. What advice could you offer to someone who finds himself or herself in a position of failure?

Q4. In your opinion, what would be one positive step that we as a society could take toward addressing failure with our young people?

Third Email

Dear [Participant's name],

In part 1 of my doctoral research, I shared with you some of what I call the 'critical events' of my life. In part 2, I would like to invite you to share one of the 'critical events' in your life with me.

I define a *critical event* as...

- an event which produces a dramatic alteration to your life's path, synonymous with a turning point, characterized by one or more of the following:

- a dramatic change in attitude, emotions or well-being
- a dramatic change in health
- a significant re-evaluation and/or change of values/beliefs
- a significant change in the person you were before the event (noticeable to yourself and possibly others)
- any other profound influences not mentioned above

My request is...

for you to select an event that you are comfortable sharing by answering the following questions. (Note: one or two sentences should suffice for all but the first question.)

- What were the circumstances surrounding your critical event? (Please include your age at the time and any other information that is relevant to understanding this event.)
- What changes in yourself did you notice during and/or after the event? emotionally, physically, other...
- How were your values/beliefs altered by this event?
- How did this event change your view about yourself, your life, your relationships, etc.?
- What have been the long-term effects of this event? How has this event contributed to the person you have become?
- What did you learn as a result of this event? If there was a lesson to be learned by this event, what might it be?
- What emotions are stirred up for you as you recall this event?

How can you share the details of your 'critical event'?

Initially, please feel free to record your answers with a pen and paper, a computer, an audio or video device. However, this is not a requirement.

When we meet via Skype, I will ask you to share your answers to these questions with me. My motivation for this change in part 2 is to a) see if there are any commonalities between people's critical events, and b) find out if this is a valuable process for people other than myself.

What if you're not comfortable sharing a 'critical event'?

If you are not comfortable with the process mentioned above, we will repeat the steps from part 1 with a slight change - I will pick the story for you to review and comment. If you recall, I will send you a video link at the designated time, and then 20-30 minutes later, I will ask you a series of questions.

Actions for you to take once you've received this email

- Email me back telling me which option you have selected: a) sharing a critical event or b) reviewing a second one of my stories.
- Propose a time to meet online (Skype).
- If you've chosen 'a' above, begin thinking about a critical event that you are comfortable sharing.

Once I hear from you, I will contact you as soon as possible to set up our meeting.

Please let me thank you once again for participating in my research. I am very grateful for what you've already shared and I look forward to our next time together.

Susan ☺

Final Email

Hi [Participant's name],

I am happy to report that I am well on my way in the writing process of my thesis. I've written 2 chapters thus far and have 6 more to go. The adventure has been very fun and I've allowed it to take me on twists and turns, keeping the interest very high.

As a result, I find myself asking for your assistance one last time. (It will have to be the last time because I have to submit the final draft this month and I can't make any more changes. *grin*)

Would you please click on the link below and fill out what has proven to be a 5-minute survey (maybe 10 if you reflect and write a lot)? [Detailed in "Final Interview (Online Form)" below]

Note that I have also attached a transcript of our conversation when you shared your critical event with me. Please feel free to refer to it. (I used transcription software that is about 90% accurate, so please pardon the odd wrong word or 3).

Please don't hesitate to ask me any questions or express your frustration at yet another task. :^\

Yours most appreciatively,

Susan =)

Final Interview (Online Form)

Q1. Was your critical event thrust upon you or did you initiate the event intentionally?

Q2a. Please finish the sentence below (if you feel it applies). Write as much or as little as you like.

As a result of my critical event, I developed an increased awareness about…

Q2b. If you experienced an increase in awareness, did this happen **before**, **during** or **after** our meeting?

Q3. Would it be fair to say you were a new person because of this critical event? **Yes** or **No**

Q4a. Did your critical event inspire you to search for answers? **Yes** or **No**

Q4b. If so, what kinds of answers were you looking for? **...** or to what questions?

Q5a. Would you say you had any type of extra-sensory or paranormal experiences associated with the event? (for example: gut feelings aka precognition, telepathy, clairvoyance, etc.) **Yes** or **No**

Q5b. If so, please describe briefly (if you feel comfortable).

Q6a. Do you think there are different levels of consciousness among people? **Yes** or **No**

Q6b. If so, would you say your critical event contributed to an increase in your level of consciousness? **Yes** or **No**

Q7. Did you reflect back on your critical event before you participated in my research? **Yes** or **No**

Q8. Would you say self-reflection is something you do **regularly**, **sometimes**, or **never**?

Appendix D.

Testing My Hypothesis Using Eastern and Indigenous Lenses

The following content was originally part of Chapter 6. I have included it here because it illustrates several important insights I gained from some representative Eastern and Indigenous teachings, which I feel deserve a place in my dissertation.

In order to gain greater insight regarding my hypothesis, *Reflection on critical events can expand consciousness*, I selected the teachings of four guides on which to base my analysis: His Holiness the Dalai Lama (Buddhist), Jiddu Krishnamurti and Sri Ramana Maharshi (Hindu), and Gregory Cajete (Indigenous). What appears below represents **my** interpretation of their texts in relation to my hypothesis, and I have done my best to maintain the integrity of their messages.

In an effort to understand the Buddhist definition of the mind, I reviewed several of the Dalai Lama's writings and arrived at this description (my wording): the mind is part of the internal, subjective world, made up of mental and cognitive events, and navigates the outside, physical world informed by the body (Lama, 1990; Lama, 2005). To this array of qualities, the Buddhist *Tantra* added that the mind's essence is "pure," but when influenced by conditioned thoughts and emotions, its true nature becomes hidden. Nevertheless, to return the mind to its "clear light nature," one has only to practise meditation (Lama, Benson, Thurman, Gardner, & Goleman, 1991, p. 17). Out of curiosity, I turned to their glossary definition of "meditation" and noted the following: "The three steps essential in the process of understanding something deeply or of gaining wisdom are learning, critical reflection, and concentrated meditation" (Lama et al, 1991, p. 130). Pondering the concept of *meditation as critical reflection*, I decided to use it as my focus and proceeded with the enquiry.

Now that I had a clearer picture of the Buddhists' conception of the mind and the significance of returning it to its *pure* state through meditation, I could begin to see how it might support my hypothesis regarding the role of reflection upon critical events. Yet to be determined, though, was how I would link this reflection to an expansion in consciousness. As I continued my search, I noted that one of the Dalai Lama's primary teachings posted on his website was entitled, *Training the Mind* (Lama, n.d.b), which gave me greater insight into the great importance Buddhists place on their quest of quieting the mind through meditation. Further to this, a quiet mind could eventually lead to "true liberation and full enlightenment" (Lama et al, 1991, p. 17). And then I had an 'A-ha' moment. Could *true liberation and full enlightenment* possibly be synonymous with *full consciousness*? Was this the missing piece? Of course, then I wondered how much I was distorting His Holiness' words in my selfish attempts to draw parallels between my hypothesis and the Buddhist teachings, so I turned my attention to its ancient predecessor, Hinduism (Jacobson, 2000).

Investigation into the Hindu beliefs about reflection and consciousness delivered me to Jiddu Krishnamurti, a fellow I had discovered over a decade ago when I first encountered his teachings on education (Krishnamurti, 2001a). Now, I looked to him for his insight on the mind, which he claimed was universal, free of thought, and possessing unlimited space (Krishnamurti & Bohm, 1986). And although he told of a paradoxical, human-made, conditioned mind, preoccupied with human-made things (e.g., suffering, confusion, separation, etc.), like Buddhism, it could be quieted through meditation and thereby rejoin the universal mind. What was very interesting to note were the shared perspectives of the Dalai Lama and Krishnamurti, suggesting that perhaps some of the fundamental beliefs in Hinduism had not been lost over time.

With respect to my hypothesis, I wondered if Krishnamurti too would support both the aspects of reflection on critical events and their potential for increasing consciousness. In the case of the former, he spoke about the importance of finding time for reflection:

> Life is complex and painful, a series of inner and outer conflicts. There must be an awareness of the mental and emotional attitudes which cause outward and physical disturbances. To understand them you must have time for quiet reflection; to be aware of your psychological states. ("Living in an Insane World," n.d.)

He also discussed the human proclivity for letting past experiences colour present ones, keeping us from the experience of the present moment. Only through the act of meditation, which required "concentration, awareness and attention" ("The Wholeness of Life," n.d.), would we be able to empty the thought content of our consciousness, be freed from the past, and ultimately change our state of mind. All in all, I took this as positive support for reflecting on critical events.

In the case of expanded awareness, on the other hand, Krishnamurti (1952) presented the concept in a way that I had not previously considered:

> Obviously, there are many layers of awareness. The spirit or marvel of what all is taking place, of the trees, the moonlight, the poor unfed child, the half-starved, the bloated tummies - they are all superficial awareness, observations. But if you can go a little deeper, there is awareness of how we are conditioned, not only at the conscious level but at a deeper level, awareness which comes through dreams, or movement when there is a little space between two thoughts, a certain unthought of, unmeditated observation. When you can go still deeper, that is, when the mind is absolutely without any reflection, recognition, when the mind is still, not experiencing, when the mind is not seeing what is stillness, there is intelligence.

By organizing awareness into the deep state reached in dreams, then followed by the deeper awareness experienced by the still mind, I found it difficult to see how my hypothesis would apply. I tried to imagine how expanded awareness might be linked to dream states or the absence of the mind, but could not.

In stark contrast to his description of awareness, Krishnamurti's references to consciousness bore more resemblance to his view of the mind. First, it possessed a time element: "consciousness is always of the past, never of the present; you are conscious only of things that are over" (Krishnamurti, 2001b, p. 27). Second, he spoke about its layers: the superficial level where thought existed, and the deeper levels which included aspects of the collective. Together, these made up the sense of self, or *me*. But how did this apply to my hypothesis, *reflection on critical events can expand consciousness*? Or, as he put it:

> Will the study of my own consciousness, of my activities, will the awareness of my thoughts and feelings, stilling the mind in order to observe without condemnation, will that process bring about a change? [...] I feel such a process cannot bring about a radical change. Of that one must be *completely* sure. (Krishnamurti, 1954, p. 268)

And with that, I knew I would not be able to ground my hypothesis in Krishnamurti's teachings.

So, I turned my attention to Hindu philosopher, Sri Ramana Maharshi, one of the most famous Indian gurus of his time. He was described as "a non-person with no mind of his own" (Sacks, n.d.), which effectively meant that he had attained enlightenment. Consequently, most of the concepts he shared with his students dealt with the spiritual realm. However, unlike the Dalai Lama and Krishnamurti, who contextualized the mind in everyday experiences, Sri Ramana Maharshi's teachings had a different tone (Excerpts taken from *Sri Ramana Paravidyopanishad*, Lakshmana and Maharshi, 1950):

- "The world is a totality of the five kinds of sensations, namely sounds and the rest, and nothing else. All these are only mental impressions. Hence, the world is nothing but the mind" (verse 125).
- "Enquiring into unrealities, taking them to be real, leads to forgetting the real [Self]" (verse 322).

- "The mind itself creates the world in the waking state, as it does in dream. But the mind does not know, either in waking or in dream, that this is its own creation" (verse 144).
- "Hence it is that the worldly means of proof, namely direct perception, tradition and inference, serve only to deceive the creature. They do not at all serve the attainment of right awareness" (verse 183).
- "The Self will remain concealed [in this way] as long as the world is taken to be real. It will cease to be so taken when the mind is once and for all extinguished; hence one must strive towards extinguishing the mind" (verse 14).

His verses appeared to coincide more with the beliefs of the Buddhist idealists, who proclaimed that external reality was merely an extension of the mind (Lama, 2005, p. 63). And it was quite clear that his interpretation of the mind was in complete opposition to that of Krishnamurti, which was an interesting contradiction, especially since it emphasized that divergent views were not reserved for science alone.

Closer inspection of Sri Ramana Maharshi's texts quickly revealed that reflection on critical events, or reflection on anything for that matter, would not be endorsed. He spared no mercy as he communicated the message to me not to waste another moment developing my hypothesis. However, despite this abrupt ending to my enquiry, he did propel me toward one important consideration. If he had indeed attained the highest level of consciousness, which would correspond to the *causal* level for Wilber, *mystical experiences* for Tart, and *enlightenment* for Hawkins, then perhaps I should not be surprised by the nature of his teachings. I could explain this metaphorically: Suppose there is a high-rise with one hundred floors, where the lowest floor is closest to material reality and the top floor signifies enlightenment. If Sri Ramana Maharshi described the world from his view, using terms I might not understand because of my lowly position, it would be silly not to expect significant differences in our perspectives. And wouldn't it also be natural to wish for a view from the top floor?

Compared to Eastern descriptions of the mind and consciousness, Indigenous teachings communicated these notions from yet another perspective. In terms of language and ritual, the First Peoples have been deeply rooted in their connection to Mother Earth and Spirit. My understanding has been that through these two, a connection to the Creator could be experienced. And like the Eastern philosophies, there seemed to be shared teachings that pervaded all Indigenous cultures, the most prevalent of which was the unity of all things. This relationship was especially conveyed through *circles*: the four directions, the four elements, the cycle of life and death, ceremonial circles, etc. It might be fair to say that these circles were also illustrative of the ever-changing nature of the universe, a perspective shared by the Eastern traditions.

Because traditional Indigenous views have honoured self-knowledge and learning through one's personal life process (Cajete, 1994), education has been oriented toward the goal of "becoming complete":

> by learning how to trust their natural instincts, to listen, to look, to create, to reflect and see things deeply, to understand and apply their intuitive intelligence, and to recognize and honor the teacher of spirit within themselves and the natural world.
>
> (Cajete, 1994, p. 228)

Although the different Indigenous groups around the world each approach this task differently, I shall try to present a few interpretations about how my hypothesis might have been regarded from the perspective of my two Indigenous guides. For instance, when considering the role of reflection on critical events, Cajete (1994) spoke about the importance of "remembering to remember" for the Native American Indians (p. 45), while Don Juan spoke of "recapitulation," or "*recounting the events of your life*" (Castaneda, 1999, p. 71). In each case, it was my understanding that the act of remembering one's identity, history, and place in the cosmos allowed individuals to move forward along their path to *completeness*. Therefore, I concluded that both authors would affirm the importance of reflection on one's critical events.

However, when it came to the idea that reflection could expand consciousness, I felt the need to expand my search since Cajete did not address the topic of consciousness and Castaneda's input spoke more to a shaman's experience. As a result, I came across George Tinker (2004), who reminded me that consciousness was not restricted to humans but extended to plants and rocks. Incidentally, said he, if there were such a hierarchy of experience in the world, humans would be at the bottom. Gerald Alfred and Taiaiake Alfred (2009) spoke about a "*loss of consciousness—consciousness here being our sense of indigenous nationhood*," (p. 19) which was a prevalent theme among much of the Indigenous literature on consciousness. He emphasized the importance of developing a strong Indigenous consciousness and maintaining connections to historical teachings. While I could only infer from these thoughts how my hypothesis might be received, it was my strong sense that these gentlemen would agree, that reflection could indeed expand consciousness, albeit in a slightly different context than I had originally envisioned.

Thinking back to the concept of perennial philosophy, I felt certain that if I had had more familiarity with Eastern and Indigenous teachings, I would have been more confident about the probable intersection between the two. Then as luck would have it, Cajete (1994) came to my rescue in his introduction of Indigenous axioms used by Tribal educators: "These interpretations of Indigenous teaching axioms are derived from a host of readings and observations related to Indigenous education in American Indian, Sufi, Taoist, and East Indian teaching traditions" (p. 224). This last-minute discovery supported Liebniz's and my belief that there were foundational principles underlying all spiritual beliefs. Dreamingly, I imagined a day where modern science might join the group.

Overall, regarding my developing hypothesis, I learned that it did not receive unanimous support from the Eastern or Indigenous traditions, but instead was divided. I could find a few reasons for this, the strongest of which was mistakenly linking the act of reflection to expanded consciousness. This was especially evident when considering the Eastern perspective, which from my understanding, conceived of consciousness as a function of the *mind*. Whereas, I had been applying a more mystical interpretation, like that of Alexander's "extension of the Divine" and Hawkins' energy Fields, to consciousness. Such disparity between definitions of consciousness highlighted the importance of cultural and spiritual influences on the way we see the world, which suggested that maybe it wasn't so important to develop the hypothesis after all, just as Sri Ramana Maharshi advised. Not to worry. This exploration allowed me to experience from many perspectives, the challenges facing emerging theories. Looking back on the question about which ones advanced, I wondered if mine had any potential to gain some footing in the scientific world. Based on my findings, however, I was content to set my hypothesis aside and turn my attention back to musing about the intersection between science and spirit.