The Jurisdiction of Science: What the Evolution/Creation Debate is *Not* About

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Elke dissipline beskik oor sy terrein van kundigheid, of, anders gestel, sy jurisdiksie waarbinne dié tipe vrae wat op daardie dissipline van toepassing is, ondersoek en onderrig kan word. 'n Dispuut kan ontstaan by die skeidings ter bepaling of 'n spesifieke onderwerp na regte een is wat binne die dissipline tuishoort en of dit iets is wat op 'n ander terrein onderrig moet word. Binne die onderrig van Biologie in skole, bestaan daar reeds vir 'n aantal jare 'n debat oor watter tipes benaderings tot die onderrig van die evolusieteorie gepas sou wees in klaskamers in openbare skole. Dit is belangrik, want vir sommige ouers het die "teorie van evolusie" dogmatiese aspekte aangeneem waarbinne teologie en wetenskap op onvanpaste wyse vermeng word. Of, die teorieë omtrent oorspronge wat

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sekere tipes geloof aanhang, hetsy godsdienstig of nie, kan weer konflikte laat ontstaan indien dit as "wetenskaplike feit" onderrig word wanneer, so word daar geargumenteer, genoegsame getuienis bestaan om alternatiewe teorieë aan te bied. Wat behoort te gebeur wanneer die verskillende beskouings in konflik met mekaar is? Afdeling I van die artikel sit sommige van die teoretiese kwessies uiteen wat op hierdie terrein betrekking het, en suggereer dat deur aandag aan die gepaste jurisdiksie van wetenskap te gee, dit sal help om die "evolusiedebat" binne 'n konteks te plaas wat voorsiening behoort te maak vir breër bespreking van alternatiewe teorieë as dié van lukrake moontlikheid en ateleologiese ontwikkeling. Die idee van "intelligente ontwerp" word spesifiek as 'n onderwerp bespreek wat dalk wel gepas vir 'n wetenskapklaskamer mag wees indien dit as 'n teorie in kompetisie met ander teorieë onderrig word – soos een kommentator dit genoem het "die onderrig van konflikte". Afdeling II van die artikel kies 'n werklike voorbeeld uit 'n dispuut wat met die kurrikulum van hoërvlak-skoolbiologiekursusse in Brits-Columbië, Kanada, verband hou. Hierdie dispuut word geanaliseer aangesien die verskillende standpunte ingeneem deur skooladministrateurs, onderwysers, gemeenskapsgroepe en die Ministerie van Onderwys self, die wydverspreide perspektiewe toon wat debatte elders geïnspireer het. Dit sluit af deur aan te voer dat die wyse waarop die saak in Brits-Columbië "opgelos" is, 'n ontoepaslike respons is op die konflikte en deur enige onderrig omtrent "intelligente ontwerpteorie" in die biologie-kurrikulum te verban, neerkom op 'n ideologiese beperking op sake wat toepaslik vir hoërskoolonderwys is.

1. Introduction

The title "the Jurisdiction of Science: what the Evolution/Creation Debate is *Not* About" was chosen for this article because it seems to the author that one of the most critical questions facing us in terms of what many call the "evolution versus creation" debate is often overlooked. In short, neither "chance" nor "design" can be proven by science. We may hypothesize about both theories but we cannot *prove* either design or chance by scientific means. This simple fact requires us, therefore, to insist that *both chance and design* be presented as aspects of the discussion. The current domination of what might be called "the assumption of an ateleological chance" is improper and amounts, often, to little more than an anti-religious dogma because it is assumed that if "design" is excluded from consideration, then so is teleology, purpose and, by inference, God.

None of these assumptions, for or against chance or for and against design are accurate and it is the burden of this article to make this argument. The author has chosen to do so by way of discussing the jurisdiction of science in order to understand better what sorts of questions are properly scientific questions and what are not. A failure to examine this point can lead to errors.

2. Part I: Theoretical aspects of the relevance of chance or design in Biology courses

Though it is often overlooked, a larger question than the false dualism "evolution" or "creation" lays behind the debate about evolution as it is often formulated. Should we include consideration of both "design" and "chance" in our biology teaching because, simply, we do not know which idea is actually behind "how it all works?" Because we operate on the basis of "what things we take on faith" (and there are both religious and non-religious faith commitments), both "chance" and "design"- based explanations are, strictly speaking, faith-based since neither can be empirically proven. The question is then one of assessing the evidence to see, over time, which approach best comports with the scientific and other evidence. But it is a mistake to assume that choosing to believe in chance is a denial of design or somehow more scientific.

In short, both the atheist, committed (unscientifically) to their being no God is in the same position as the theist committed (also unscientifically) to the claim that there is a God. Science cannot help either of them since the key questions are non-empirical.

In fact, it is logically possible that "chance" operates within a system of overall design. So the fact that many religiously committed people might see "chance" as the enemy of God (or design) or non-religiously committed people might see "design" as the enemy of free scientific inquiry (or what have you) does not lead to a pre-emptive exclusion of either "chance" or "design" as outside the broadest scientific discussion. But the adoption of one side to the exclusion of the other is simply bias and not in the spirit of free inquiry or within the proper jurisdiction of science.

Much of the contemporary discussion of the roles of science and technology as they relate to faith and society has to do with the scope or the competency of science and philosophy. Science cannot tell us either why something exists or what its ultimate purpose is. The question of ultimate causes or ends is the province of philosophy and religion. But it is a serious mistake to assume that only the religiously committed person has faith or beliefs. To live as a human being is to be a believer, the question is "in what do we believe?" not whether we believe. Similarly, to make assumptions is to have faith of some sort.

The author uses the word "faith" here, in relation to society, to include both the more organized and defined "religious" faiths as well as the

natural faith everyone has whether or not they know it. People often make the mistake of assuming that only religious people have faith (that is they trust things that they do not or cannot empirically prove to themselves in the manner in which they live).

A scientist trusting in the accuracy of his or her instruments and observations relies upon faith just as much as, but in a different sense, the person trusting that the sidewalk he or she walks upon is actually there; that the world around them will perform in predictable ways; that the sun will rise tomorrow; or that they will continue to live beyond the moment so as to undertake projects of a variety of sorts (including experiments). Religious people just have a different basis to describe what (or whom) they believe and trust in than those who operate with a less developed theory based on "natural faith." So the question at all times, contrary to the current confusion of secularists language, is not whether we have faith or not but what kind of faith or faiths we have and operate out of? And "faith" for many people is something they do not think about; but it is faith nonetheless. It is, when not considered, implicit rather than explicit faith that they base their lives upon.[1]

The term "Jurisdiction" is usually used for legal matters but the second root of the word in addition to *jus* for law is *dicere* for "speak." So the question of the jurisdiction of science is an invitation to consider what is the area of the proper authority of science.

Every age has its strengths and weaknesses, those areas it more naturally focuses upon and those towards which it tends to have blind spots. An era that is aware of the world of spirit and religion might focus too much on these to the detriment of science and the material order or might bend science to conform its conclusions to over-reaching religious claims. Another era, focused, perhaps rather more on the material than the spiritual, the physical rather than the *meta*physical might focus too much on what are perceived as "material facts" and not enough on how these physical facts relate to other questions of life. In such a condition, science might be bent to conform its conclusions or methods so as to over-reach to the detriment of what is

1 The author has profited greatly from Professor Thomas Langan's insights on "natural faith" in his book *Being and Truth* (Missouri: Missouri University Press, 1996) and from discussions with him over several years. Earlier recognition of the reliance of science upon "natural faith" and the risk of science inappropriately assuming a religious function in culture thereby excluding the questions that are properly religious is found in John Henry Cardinal Newman, "The Tamworth Reading Room" in *Discussions and Arguments on Various Subjects*, (London: Longmans, 1899), 254-305 and, in particular, "Secular Knowledge without Personal Religion Tends to Unbelief" at 298-305. The importance of "natural faith" in relation to the understanding of law and what we mean by the term "secular", also in relation to "natural faith" has been examined elsewhere; see: Benson, 2000: 519-549.

properly the territory of metaphysics and religion. At all times the areas of overlap must be carefully and sensitively handled. This question of overlap poses a particular difficulty when disciplines are not in proper communication with each other as in the contemporary age.

Many philosophers today lament the fragmentation of learning as universities have become multi-versities and inter-disciplinary perspectives[2] can all too easily be driven out of sight by a variety of competing pressures.

In a profound study entitled, *Science, Faith and Society*, and that has aged little since it was first published in 1946, Michael Polanyi commented on the importance of science staying in close contact with what he termed "spiritual reality" and the need for commitment to "emergent meaning and truth" (Polanyi, 1946: 17). Polanyi, in words that have relevance for every area of our lives in western countries, wrote:

> … if citizens are dedicated to certain transcendent obligations and particularly to such general ideals as truth, justice, charity and these are embodied in the tradition of the community to which allegiance is maintained, a great many issues between citizens, and all to some extent , can be left – and are necessarily left – for individual consciences to decide. The moment, however, a community ceases to be dedicated through its members to transcendent ideals, it can continue to exist undisrupted only by submission to a single centre of unlimited secular power (ibid., 78 - 79).

We ignore the importance of this question of the jurisdiction of science at our peril. For the consequences of defining science in such a way that the moral ramifications of the actions of scientists are viewed as outside some supposedly "pure" realm of research is unwise because who has the knowledge of the new thing but the scientist working on it? As Denis de Rougement once asked, "if science rules the world, who is to rule science?" (de Rougemont, 1955: 20).

The idea that any area of human endeavor operates outside moral evaluation is just wishful thinking by those who do not want to make the effort to do the moral work required or who wish others to do their thinking for them or who simply "don't care" what the implications of their theoretical work are on the practical level. We are surrounded now by area after area of culture deceived by those who claim that their area operates free from morality: business, law and science, for example all have proponents that suggest the discipline functions according to the "laws of the market place" or the "laws of science" or some other law than a human moral law.

2 The literature in this area is vast. One essay that ought not to be overlooked is Grant, 1969: 113 - 133.

For no amount of knowledge about *how* things work will tell us either *why* they exist nor whether what they may do is good or not. Science cannot tell us the answer to the question "why is there something rather than nothing?" Science itself cannot tell us if a discovery will work for the good or ill of people. And no-one is so naive as to say that the question about how or whether to apply scientific discoveries, is an irrelevant one. The idea that we can simply focus upon the fact of discovery and avoid the questions of why or whither – is dangerous.

Interestingly this positivism, of the separation of an area of insight from moral analysis, has parallels in other areas of human learning. To take law for example, it is the debate between legal positivists and natural law theorists about whether laws are formal things separate from whether they are good or bad laws, that provides a significant portion of the fodder for philosophy of law classes. Do not ask about the goodness or badness of laws says the legal positivist, if this law satisfies the formal requirements for law then that is all we can properly say about it.[3]

Isn't this just the kind of debate that is involved between "pure" science and the questions of how the science is to be used? No amount of fathoming the material constituents of bodies will tell us about the soul. And the importance of the soul, of that immeasurable part of humankind, has been the preoccupation of philosophy and theology for thousands of years. So critical is this contemplation of the soul, in fact, that Aristotle in the *Ethics* says that "the true student of politics must study virtue above all things and must study the soul…" And, further, Aristotle noted that classification of which questions belong to disciplines is important:

> For it is the mark of the educated mind to look for precision in each class of things just so far as the nature of the subject admits; it is equally unreasonable to accept merely probable conclusions from a mathematician and to demand scientific proofs from an orator.[4]

Now neither virtue nor the soul can be measured, quantified or described by science and yet what we are as human persons and communities, what

3 See, for example, and excellent overview of various theories both of legal positivism and alternative theories in Bix, 2006: 33 ff.

4 *Nichomacean Ethics*, Bk. 1, Chap 3, para. 4. It is interesting to note that this sort of distinction is made by Pope John Paul II in his "Truth Cannot Contradict Truth: Address to the Pontifical Academy of Sciences, October 22, 1996". The reference to the origins of life and evolution notes:

> Consideration of the method used in the various branches of knowledge makes it possible to reconcile two points of view which would seem irreconcilable. The sciences of observation describe and measure the multiple manifestations of life with increasing precision and correlate them with the time line. The moment of transition to the spiritual cannot be the

the moral laws are or may be that govern our lives together would seem to be an issue that is fundamental to our communities. To view the matter from another angle, the pure scientist might be a very impure person. So to focus on only the purity of science at the possible expense of *the kind of person we are training to be scientists* would seem to be a highly relevant matter that we ought not to avoid in all our analysis about whatever technique we are discussing – whether it be the scientific method or some other discipline that is being discussed. Science, at the least should not foreclose matters it cannot comprehend.

Morals are said to be, in that hideous language of the modern era "personal values" and judges do not wish to get involved in "moral questions." Yet the fact that we are not trained in this area or are not comfortable with an area such as morality or the interface between religions and morals in a pluralistic society, does not mean that we can avoid moral questions: the moral character of a society is a fact. To not discuss or teach about morals is to be taught by that silence.

There is no neutral space to occupy since so-called neutrality is filled with morals of whatever sort. And one of the most potentially dangerous statements of the modern world is often seen as one of its greatest affirmations. I refer to the statement that "you have your values and I have mine." When applied to aesthetic determinations such as what kind of food or clothing or music one likes, there is a certain undeniable truth to this statement and "values" as an economic term have a certain private dimension to them. But when "values" are the language we use to discuss moral choices themselves – like respect for life or what used to be called "virtues" then we have taken an objective criterion and made it relative. And it is the relativism of modern life that is so dangerous for our pursuit of shared goods together.

The late English judge, Lord Denning, one of the most influential and learned judges of the twentieth century, began a talk at Cambridge University in 1982 by quoting the scriptures and asking "what profiteth a man to gain the whole world and lose his own soul?" Now this was a startling thing to hear from a judge in that setting. But Lord Denning knew that law as a *technique* is not the same thing as understanding the *purpose* of law or human communities and was urging those of us in the

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object of this kind of observation, which nevertheless can discover at the experimental level a series of very valuable signs indicating what is specific to the human being. But the experience of metaphysical knowledge, of self-awareness and self-reflection, of moral conscience, freedom, or again of aesthetic and religious experience, falls within the competence of philosophical analysis and reflection, while theology brings out its ultimate meaning according to the Creator's plans (para. 6).

audience to consider a wider context for legal techniques. He was right to do so.

And as it goes for the law of society, so it is for the laws of science. They can tell us how things work but they cannot tell us "why" they work nor what their purposes are. They can tell us how such and such a thing might have come about but they cannot thereby inform us whether or not such and such a thing ought to occur. For the minute the word "ought" is introduced, or raised, we are then in the realm or jurisdiction of morals, not science.

In an interesting book dealing with the trial of accused former Nazi's in England, one can read the letters back and forth between top-ranked officials in the German government of the day[5] and the executives of the I.G. Farben company (Hill & Williams, 1965). The discussion was very scientific … how many "units" could be processed through the particular machinery involving thermal energy and certain human actions in a particular time after another process that involved exposure to a certain chemical pellet. Yet, the thermal energy was the gas ovens and the human actions involved the disposal of large numbers of human beings after they had been exposed to Zyklon B. and gassed. And all this science and business happened only a few years ago. Those letters seemed shocking because the techniques of the corporate world and science seemed so adept at simply avoiding the moral questions. Technique had become entirely separated from moral questions. Have things changed appreciably since that time? How well are we doing culturally in integrating moral with technical questions?

At the invitation of a school principal some years ago, the author gave a series of talks to a small group of Grade 9 students about the arguments for and against belief in God. What intrigued him at that time was how confident some of the students were that science could explain everything. The students had, without knowing the source, decided that they simply had no need of the God hypothesis or of informing themselves about wider philosophical or theological questions.

Somewhere in their training at school or at home (including exposure to television and computers) these students had got the idea that science is the new explanation for everything and has simply replaced religion as an explanatory framework. They did not state this as an observation, or tentative hypothesis, but as a necessary fact. They believed that science is simply a better explanation than religion. Science, being newer, being current, was seen by them as a replacement theory, as being correct, as

5 On the risk of the concept of a "pure" science cut off from deeper moral and ethical concerns, see Somerville, 2000: 296-300.

offering a new explanation for which religion was, in a sense, the old explanation.

To the credit of the school principal, he, though not a religious adherent himself, recognized that this matter called for some discussion with his students and that was how the author came to be invited to address the class. It was a fascinating and chastening experience and led to the realization that in the contemporary world, perhaps it would be useful to examine in a wider context what opportunities there should be, within teaching of science itself, to raise the questions of the relationship between science and other disciplines including those questions that make us uncomfortable because they raise the borderline questions that are most likely to keep technique and purpose before us. One area in which such issues could be raised is the one that is the subject of this article – what Gifford Lecturer Stanley Jaki has called "the Science of Origins." How well are we doing in keeping context with theory in science?

3. Part II: Case study of the 1995 Abbotsford School District Dispute over the Curriculum of Biology Courses in High School

It may assist our analysis of context and theory to consider a practical example for our discussion of the jurisdiction of science. A good example exists if we take, as a case study, a situation that occurred in the province of British Columbia, on the west coast of Canada between the Spring and Fall of 1995 at a School District in the town of Abbotsford. This debate usefully frames some of the key questions and issues.

What occurred was described publicly as a debate about the teaching of creation science in public education alongside theories of evolution. When the facts are analyzed, however, it was actually not about this simple a conflict. And what eventually resulted in the public school Guidelines province-wide was not only the complete exclusion on any teaching of creationism but any teaching or discussion of "creative evolution" or "design theories" as well as a prohibition of adding anything to the curriculum whatever.

The Abbotsford situation is a worthy case-study for our topic because as it unfolded it became clear that the role of science in education is one that has widespread implications for political, philosophical and theological disciplines as well, as we saw in Part I of this article.

In any case, the author would like to first describe a general overview of what occurred in the Abbotsford School District in 1995, what followed from it and then raise what seem to be a few questions that should be

addressed.[6] This article will not evaluate the situation of science education in other provinces, nor will it deal with the scientific debate at the root of the dispute in Abbotsford. For the purposes of our discussion the author would like to see if we can parse out the principles that were operative in British Columbia and see whether they reflect an accurate assessment of the role of science in contemporary culture and, if so, whether that role is one that is proper to science and culture or one that will, over time, cause problems for our common life in community. The author will argue that the issue is not, in fact, evolution or creation but something more fundamental than either and that can only be addressed if we look at what sort of questions are properly scientific and what are not.

Abbotsford is a largely rural area in the Fraser Valley near Vancouver in British Columbia's lower mainland on the west coast of Canada. The Abbotsford School District, in 1983, drafted a policy regarding the teaching of biology (and specifically the teaching of the theory of evolution) in the high schools in its District. The original policy was drafted in response to the beliefs of many parents and school trustees that alternative theories to evolution and chance origins ought to be available.[7] The 1983 policy permitted the exposure of students to alternative explanations in addition to the theory of evolution in biology classes.

The original 1983 Abbotsford School District Policy on the Teaching of the Origin of Life, and which was consistent with the curriculum guide then in place, reads:

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6 The Panel that commented on an early version of this article in Toronto July 9, 1999 were: Dr. Peter Hodgson, Head, Nuclear Physics Theoretical Group, Oxford University; Dr. Denis Lamoureux, St. Joseph's College, University of Alberta, Edmonton; Dr. Daniel Osmond, Department of Physiology and Medicine, Faculty of Medicine, University of Toronto; the Moderator was Dr. Ronald Cole-Turner, Pittsburgh Theological Seminary. The program was taped for subsequent national radio broadcast by the Canadian Broadcasting Corporation, courtesy of Max Allen, Senior Producer of "Tapestry" and "Ideas."

7 In conversation with John Sutherland, the Chair of the Abbotsford School Board in June 1999, Mr. Sutherland made it clear that even at the time of the original 1983 policy "at no time was there any expectation that teachers were expected to teach alternative theories of creation or that there be a so-called "balanced" approach" they were only expected to expose the students to the fact that alternative materials and/or speakers were available. Teachers were expected to teach the curriculum and expose the students by letting them have access to materials in the school libraries that the District had assembled or to have guest speakers in to address classes. The use of outside guest speakers had virtually died out in the late 1980's. Sutherland made it clear that the teachers were told they were expected to teach the curriculum and never "creationism." As Sutherland says with exasperation, "I made that point a thousand times to the media and the Minister but without success" (personal conversation with the author).

> In view of the fact that neither Divine creation nor the evolutionary concepts of the origin of life are capable of verification by means of scientific experimentation, all teachers, when discussing and/or teaching the origin of life in the classrooms, are requested to expose students in as objective a manner as possible to both Divine creation and the evolutionary concepts of life's origins, with the evidence that is presented in support of each view, and to refrain from any assertions that would set forth either view as absolute.

All proceeded quietly until a complaint was made to the Ministry of Education in British Columbia in 1995.

Other groups in the Province were concerned about the need for students to be exposed to competing theories. In 1995, the British Columbia Association of Parents Advisory Councils voted on a Members' Resolution dealing with the teaching of science in schools. The Motion was carried and read as follows:

> Be it resolved that the British Columbia Association of Parents Advisory Councils request the Ministry of Education to ensure the opportunity for students to be:
>
> 1. taught the most commonly held theories on the origins of our universe and life on our planet, or at least be given a list of resources to explore these on their own;
> 2. encouraged to discuss the pros and cons of these theories without being criticized for their opinions, in order to promote critical thinking skills;
> 3. taught evolution as a theory, not fact. (Minutes of the 1995 BCCPAC AGM.)

No doubt the successful passage of this motion concerned those who had reason to wish origin/evolutionary theories and assumptions unchallenged and alternative (religious and other?) theories excluded from the province-wide public school biology courses.

Two months later, in April 1995, the province's Minister of Education wrote to the School District indicating that concerns had been expressed about "the teaching of 'creationism' in the science curriculum."

The Minister noted in his letter to the Chair of the School Trustees that the Grade 11 (next to final year of school) Biology Curriculum included a component on "Adaptation and Evolution" and that the Curriculum Guide accompanying the course materials "does not contain a component or learning outcomes on 'creationism' as this is not considered a scientific theory but, rather, a religious theory." It was also pointed out that:

> Teachers may explain to students that science is only one way of learning about life, and that other explanations have been put forth besides that of biological science. However, as these viewpoints, including 'creationism', are not derived from the discipline of

> biological science, they are not part of the Biology 11 curriculum….While teachers are encouraged to be aware of, and to respect, the personal beliefs of their students, they should do so without providing instruction any one belief system.

It was also pointed out by the Minister that the Provincial *School Act* provides that "no religious dogma or creed shall be taught in a public school." The Minister then sought assurances that the policies and practices of the School District were in conformance with the learning guidelines.

This letter was answered by the School Board which pointed out that they had, in fact, surveyed the teachers in the district and determined that "creationism" was not, in fact, being taught in the schools.[8]

The Minister responded to the Board by saying that "…it is inappropriate to add onto, delete from, or replace a unit or topic in the Biology 11/12 Curriculum Guide." The Minister then demanded that the Board's policy be rescinded and replaced with the following policy:

> In view of the fact that concerns may be expressed by some students and parents respecting the teaching of the topic "Adaptation and Evolution" in the *Biology 11/12 Curriculum Guide;* and, that the evolutionary perspective of modern biology may conflict with personal beliefs, teachers, when teaching this topic in the classroom, should explain to students that science is only one way of learning about life, and that other explanations have been put forth besides that of biological science. <u>As Divine creation and other viewpoints are not derived from the discipline of biological science and are not part of the curriculum, teachers will refrain from providing instruction in Divine creation, in any single belief system or viewpoint, or adding any other topics or units not already set out in the *Biology 11/12 Curriculum Guide.*</u> In all cases, teachers are encouraged to be aware of, and to respect,

8 The letter from John Sutherland (in possession of the writer) reads, in relevant parts:

> Your letter implies that teachers in our district are teaching "creationism" to their students. Our superintendent, Dr. Robin Arden, has surveyed all our Science teachers and has assured me that students are not being taught "creationism" in our schools. In particular, the Biology 11 teachers follow the philosophy statements as outlined on Page 7 and 8 of the Biology 11 and 12 Curriculum Guide….I can assure you that the policies and practices of School District No. 34 (Abbotsford) are consistent with the learning outcomes set out in the Curriculum Guide for Biology 11. (Attached were statements from Science Department Heads at the seven schools and each indicated that "both the theories of evolution and Divine creation" are presented to the students as alternative theories. All said that students are free to choose the position that best suits them and, if an assignment is given, they must support their position with research. All Heads pointed out that the matter of both evolution and alternative theories being presented had not been an issue "until now.")

> the personal beliefs of their students without providing instruction in any one belief system (underlining additional).

Obviously it was assumed that by "any single belief or viewpoint" did not apply to the sole teaching of evolution and chance origins (and what particular form was never addressed). Significantly, "no other topics" could be added.

Meanwhile, at the same time, other groups in the community became involved and both the local Teacher's Association (union) President and the British Columbia Civil Liberties Association wrote letters to the Minister to express their concerns about the School District's Policy. According to the union President the teaching of alternative explanations for origins offended the *School Act* requirement that schools shall be conducted on "strictly secular and non-sectarian principles" and that "no religious dogma or creed shall be taught in the school."

In addition, the union President said that the ramifications of the policy could be "devastating" for the community because "few teachers will want to get into the politics of the creation vs. evolution matter" and there is a possibility that some will not teach evolution at all. Moreover, since the Board Policy allows for the teaching of creation, a "most difficult 'problem' arises because parents may 'push teachers to include Divine creationism in their classes' ". In one instance, the President alleged that a parent discovered that a teacher was not including any materials on Divine creationism and so the parent wished to have some materials included and gave the teacher a 20 minute video he could show in his class – "this I find extremely dangerous" wrote the union President.

While this issue was heating up, the Press was uniformly hostile to the School District and portrayed them at every turn as "fundamentalist creationists." Despite the Board Chairman's assurances that the bible creation story is not preached but that "creation and evolution are presented as theories about how life began and [we] let the students decide for themselves" the critics focused on the provision of materials about creation as imposition against, presumably, the neutrality or fact of *purposeless* evolution. The assumption was that matters held as "natural faith" but identified as "facts" are to be accorded greater value than views that may be based on alternative explanations *whether or not* grounded in religious faith. This kind of distinction (that discussion of "design" or other teleological approaches, for example, need not be framed as necessarily "religious") was never raised and Board chairman, Sutherland, expressed frequently his frustration with the way the media covered the issue.[9]

9 The *Province* newsarticle editorial of Thursday 11 May, 1995 (A40) for example, under the heading "Weird Science" stated that "Board Policy is to espouse creationism along with evolution" and asked rhetorically:

It is interesting to note that media coverage failed to point out that science classes are provided in every school province-wide but there is no provision for so-called "religions classes" as the editorial suggests. The dominance of non-design or "chance based" scientific approaches is therefore effectively guaranteed by this approach and was not seen, itself, to be an imposition or "indoctrination" of a view.

Quoted in a column in the national article the *Globe and Mail* (Friday, 26 May, 1995), then Minister of Education Art, Charbonneau (himself an engineer), stated:

> To try to construe creationism as science is false and not acceptable to me…evolutionary theory, the theory of gravity, the theory of quantum mechanics are all subjects on which one can do objective tests and present evidence. You cannot present tests of religious dogma. Either you believe it or you don't. The *School Act* specifies that religious teaching will not occur in the public system, and I have instructed the Abbotsford board to correct this problem [underlining added].

Note how "alternative theories" are considered "religious dogma" and nothing may be added to the curriculum. But here, again, no one turned his attention to the possibility that consideration of the strengths and weaknesses of *all positions* (of whatever sort, evolution, creation, chance and design) would benefit the greater understanding of students and might not as likely lead to the prejudices that a so-called "pure science" approach more readily admits.

In addition to the media, other local groups weighed in. The British Columbia Civil Liberties Association wrote to the Board on 31 May, 1995 and urged that the Board comply with the Minister's request saying that "… the Genesis account of creation should be taught in [the non-existent] religious studies classes, together with the creation accounts of other world religions." The Association stated that the materials used to teach "creation science" "are part and parcel of a fundamentalist Christian perspective" and to that extent the policy of the School Board was, in the Association's opinion, in breach of the *School Act* provision requiring "non-sectarian" education.

> You want to talk about Adam and Eve? Go ahead. But don't call it science. Noah's Ark? Fine. Put it in a comparative religions class where it can be discussed along with such myths as the earth being carried on the back of a giant turtle. But it's fraudulent to take a theory that's unfounded in science and serve it up as an equally valid alternative to the best available scientific explanation for how we got here. The Abbotsford board should co-operate it should also recognize that if creationism is taught in biology class, it might open the door to other schools using forms of indoctrination the board might not approve of [underlining added].

The Civil Liberties Association alleged that some of the materials in the District came from the Institute for Creation Research in California and that these materials make it clear that the dissemination of the materials is part of a wider evangelical purpose. Finally, the Association stated that the present *School Act* "properly attempts to ensure neutrality with respect to religious views in our public schools. …" The School Board policy would lead to students being "… disadvantaged without any understanding of evolutionary theories as they compete for post secondary positions and jobs."

Here again, even if (and there was never any evidence of this) the materials being used in classes came from a "fundamentalist" or "Creation Research" perspective, there is nothing to say that the arguments within them could not be usefully critiqued in a program for students in the higher grades. Moreover, even if true, to suggest that these sorts of materials are the *only* alternative materials available to challenge certain forms of evolution, is simply wrong and testifies more to an overly defensive protectionism than a free discussion of academically respectful ideas. The Civil Liberties Association made no reference at all to intelligent design or teleological theories constituting "dogma" or "indoctrination". This dimension of the discussion was simply ignored.

No mention was made that, perhaps, entire confidence in "chance" as the operative cause of everything might not be its own sort of dogma nor that "chance" could well be seen within or as part of an overall system the parameters for which might be established by some teleological framework outside the bounds of measurable science itself. In short, chance could just as much be a part of design as could evolution. The question of ultimate purpose is not "defeated" by introduction of chance or evolution operating within science. As has already been stated, neither "chance" nor "design" can be proven scientifically so to categorize one or either as scientific fact is just bad science. Both ought to be presented theoretically with the "gaps" and implications of both spelled out for students to consider. Fundamentalism, as an attitude, is just as present in false scientific claims as it is in inappropriate religious claims. The issue is not, therefore, evolution *versus* creation or chance *versus* design. Why these false dichotomies are the meat and substance of these debates is an interesting aspect of our current disputes.

In June of 1995 the Abbotsford Board re-crafted its policy "…to promote critical thinking skills, students shall be encouraged to discuss the scientific pros and cons of evolutionary theories and alternative theories…"[10]

10 The entire statement in context read:
Teachers may find that the evolutionary perspectives of modern biology conflict with the personal beliefs of some students; therefore, when teaching this topic in the classroom, teachers should explain to students that science is only one

The British Columbia Civil Liberties Association remained unsatisfied and said that no "faith-based accounts of the origin of human life…" could be tolerated in a public school.[11]

Note what is implicit in this letter. "Faith based accounts" are for religious studies. The writer, and presumably the Civil Liberties Association itself, considers that belief in evolution or "chance" origins are not "faith based" or equally as "hypothetical" as teleologically based explanations. Chance as the only operative principle is assumed to be, erroneously, entirely factually demonstrable.

The literature within science is rife with dispute and counter-dispute about all manner of theories. A "science of the gaps" is just a materialistic analogue to a "god of the gaps." The failure to identify and acknowledge gaps is a mark of ideological brittleness not genuine inquiry. Leading scientists of all stripes have pronounced the notions of chance origin or certain naturalistic assumptions indefensible on this or that front.

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way of learning about life, and that other explanations have been put forth besides those of evolutionary biology. Other viewpoints not derived from biological science are not part of the Biology 11/12 curriculum issued by the Ministry of Education. In order to promote critical thinking skills, students shall be encouraged to discuss the scientific pros and cons of evolutionary theories and alternative theories without being criticized for their opinions. Where other viewpoints are presented or discussed, teachers are encouraged to be aware of and to respect the personal beliefs of their students without promoting, through instruction, any one evolutionary view or alternative belief system. This discussion would include the evidence/information both for and against the theories of the origins of our universe and the diversity of life on our planet. (emphasis added).

11 The Civil Liberties group wrote that the first paragraph of the above re-drafting was fine but described the second paragraph as:

> …simply a more subtle effort to allow religion to pose as science or "critical thinking." As such it preserves the status quo for inculcating religious views instead of scientific ones. We object to this tactic as deceptive, dishonest and self-serving…. It is the policy's encouragement of the discussion of "the scientific pros and cons of the alternative theories" that may violate the law. In essence, it sanctions the teaching of religious accounts of the origins of life in biology class….
>
> We believe that "Creation Science" is "religious dogma" that is prohibited under section 95 [of the *School Act* in British Columbia] because the account of the origin of life described by fundamentalist Christian belief is based on faith and not open to scientific verification or testing….
>
> We reiterate our position that Creationism, as other faith based accounts of the origin of life, is a legitimate topic for a religious studies or comparative religion course. Students should have access to a wide range of ideas. However, it is your encouragement of exposing students to a religious view posing as science that is not acceptable (underlining added). Letter from then President of the BCCLA Dale Beyerstein to Abbotsford School District Chair John Sutherland (in possession of John Sutherland).

The author was present, for example, at Cambridge University in 1982 when Professor Fred Hoyle announced to a crowded Senate House containing most of the biology faculty, that the theories underlying the official biological orthodoxies of the day with respect to the origin of life and evolution were, in his view, largely untenable and contained levels of probability that would never be accepted for other theories. Far from being hooted down, many of the people present agreed that there were serious difficulties with the current theories.[12] So, to say the least, overconfidence in the entire structure of evolution, without mentioning the serious challenges to its various theories would seem to be misleading and arrogant, if not dishonest.

Science and technology need to be informed by moral analysis found outside scientific method itself. At the very least, therefore, the kind of strident exclusion of alternative explanations and corresponding implicit denial of the content of those descriptions leads in the direction of an alienation of science rather than an integration with disciplines that could inform it. The British Columbia curriculum materials make no effort to link the study of science with any philosophy or moral/ethical analysis of any kind. The only formal linkage is to "gender studies" and "multi-culturalism" neither of which contain any epistemological rigour in the moral area.

In short, it seems that the approach this debate in Abbotsford shows is a bias against alternative explanations for which there might well be valid scientific support and important implications for science to consider.

Following the re-drafting of its policy in an attempt to find a midway between the Scylla of Education Ministry criticisms and the Charybdis of maintaining openness to alternative theories, the Board again entered into the odyssey of seeking a legal opinion.

The opinion they received from learned counsel noted that the revised policy provided for a balanced approach to the teaching of evolution and other alternative theories but "that is not in accordance with the curriculum." The

12 In his *Of Men and Galaxies* (Seattle: Univ. of Washington Press, 1964), Professor Hoyle suggests that a religious hypothesis "that the emergence of intelligent life is not a meaningless accident" can be followed in a non-orthodox direction. That is to say, without presuming to know what the meaning of life is. Professor Hoyle, nonetheless, states that: "Intelligent life is such a remarkable phenomenon to emerge out of the basic physical laws that some connection seems implied, i.e., some correlation between laws and consequences of the laws – what in common terms we would call a *plan* [that this notion of a plan should be explored by science for the good of all humanity]" (at 62). Hoyle, echoing views of Professor Freeman Dyson, see note 16, below, that "the probability of there being intelligent life "out there" is overwhelmingly high" (at p. 72).

legal opinion suggested that the policy "must acknowledge that the concept of evolution as set out in the curriculum guide will be taught as a stand alone concept. Neither the policy nor its application provide that evolution is taught as one of two main theories" (underlining added).

While policy-making was recognized to reside with the Board it was noted that the Minister had the power, under the *School Act*, to appoint an official trustee and terminate the employment of Board Trustees were they to be found in "substantial non-compliance" with the *School Act* or *Regulations* or *Orders* under it. While the legal opinion did not consider the policy on the Origin of Life to constitute "substantial non-compliance" it was noted that the Minister "may choose to exercise that option".

One might call this the exercise of scientific "neutrality" with a vengeance.

It was also pointed out that a school district might develop and offer local programs for use in schools and that such a program could be a program on Origins of Life. Such a program would only be optional and must not be considered religious indoctrination.

Further deliberation became a moot point on 5 September, 1995 when the Minister of Education issued Ministerial Orders and a revised Biology 11/12 Curriculum Guide to ensure the complete exclusion of "religious beliefs or religious viewpoints" from the biology curriculum (these exclusions continue to the present day – 2007).

Relying upon the "non-sectarian" provision of the *School Act* and the constitutional provision in the *Charter of Rights and Freedoms* guaranteeing "freedom of conscience and religion" the three ministerial orders replaced the province's curriculum guide and learning outcomes.

The original 1995 amendments provided:

> Concern may be expressed by some students and parents because the evolutionary perspective of modern biology conflicts with personal religious beliefs. Teachers should respect these religious beliefs; however, because religious beliefs and views flowing from religious beliefs on these matters are not derived from the discipline of biological science, teachers should refrain from providing instruction in or requiring discussions on these beliefs. Under no circumstances may a teacher as part of a science course, provide instruction in a religious dogma or religious belief system.
>
> While respecting the personal beliefs of students, teachers are only to provide instruction in classroom activities in accordance with the scientific purpose and scope of the learning outcomes set out in this curriculum guide. These learning outcomes do not include any religious instruction based totally or partially on an interpretation of religious scriptures or writings nor on beliefs or viewpoints commonly characterized as creationism, theory of divine creation, intelligent design theory, or other theories based on religious beliefs.

> Similarly, in the choice and use of learning resources to support the learning outcomes of the science curriculum, school boards, administrative officers and teachers should ensure that no religious dogma or religious belief system is advocated or presented as part of the discipline of science [underlining added][13].

Much turns, of course, on how "faith" or "religion" is defined in this schema. It is clear from the approach the ministry has taken that only expressly "religious" positions are religious. But this is contentious and avoids entirely any thought of other "faith" positions whether animated by religion or not. After all, all human beings are believers of some sort, the question is not whether they believe, but what they believe in. Of course, contemporary society begins in its definition of "secular" by assuming that it is "neutral" and in any relevant respects "non-religious" or "non-faith".

Secularism then urges upon culture a strongly dualistic conception in which only religious beliefs are outside the supposedly neutral "secular". In fact, all citizens being believers, the only beliefs left inside the "secular" by this kind of characterization, are those beliefs that emanate from atheistic or agnostic presuppositions. When the matter is argued this way it is clear that an unfair exclusion of religious beliefs has occurred. In a case that went to the Supreme Court of Canada in 2002, the nine judges of the Supreme Court unanimously upheld a united three justice division of the British Columbia Court of Appeal in finding that "secular" should be interpreted to be religiously inclusive rather than religiously exclusive.

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13 Almost a decade and a half later, this language remains essentially unchanged in the most recent course requirements (The Integrative Resource Package, Revised 2006 which is to be implemented in 2007 and 2008 may be found at: http://www.bced.gov.bc.ca/irp/bio1112_06.pdf). It now appears under the heading "Course Requirements Respecting Beliefs" and, after pointing out that parents are the primary educators of their children, states, in relevant part:

> For many students and teachers, the study of some science concepts may lead to issues and questions that go beyond the immediate scope of curriculum (e.g., science is used to meet many industrial requirements, but industrial decision makers must consider factors other than scientific feasibility before adopting a particular process). The technological application of science in areas such as genetic engineering, human reproduction, and medical technology raises questions of ethics and values. Because these social questions arise, in part, from capabilities that science makes possible, they should be addressed. It must be made clear to students, however, that science only provides the background for what is hoped will be informed personal and social decisions. Teachers must handle these questions objectively and with sensitivity.
>
> Reconciling scientific discoveries (for example, in genetic engineering) and religious faith poses a particular challenge for some students. While respecting the personal beliefs of students, teachers should be careful to distinguish between knowledge based on the application of scientific methods, and religious teachings and associated beliefs such as creationism, theory of divine creation, or intelligent design theory.

The implications of this paradigm shift is in its infancy but it has vast implications.[14]

The shift has not been applied to the biology curriculum issue in British Columbia. What occurs frequently is that the expressly religious aspects ("creationism") are lumped in with other conceptions ("intelligent design as a possibility or theory") that are not necessarily religious.

The Ministry of Education Press Release (7 September, 1995) that accompanied the Guideline Revisions stated that the revisions "…have been revised to make it clear to school boards that teaching creationism as part of a science course is not permissible in B.C. schools." But much more than "creationism" was excluded.

The Press Release quoted the Minister in the following terms:

> The science classroom is not the place to provide instruction or require discussions of religious dogma or religious belief systems" said [the then Education Minister]. "It is my expectation that all school boards will comply with the law and ensure that biology courses are offered in accordance with the curriculum guide and ministerial orders. The only place where instruction on religious belief systems may occur is in a locally developed comparative religions course.

In a letter to the chair of the Abbotsford school board, the minister required the board to provide a new policy that complies with the revised curriculum guide and ministerial orders by 15 Sept. [1995]….

> The curriculum guide – which outlines curriculum and learning outcomes for biology 11/12 courses – was changed to clearly specify that, despite the personal beliefs of some students and parents, the unit on adaptation and evolution must be taught….
>
> … The changes provide that creationism, or any religious belief or dogma, are clearly outside the material that can be taught to meet biology 11/12 learning outcomes *or the learning outcomes of any provincially mandated course* (emphasis added).

One wonders where "design" or purpose/teleology and the possibility of them or even the nature of the debate itself, such as the implications of assuming a universe based upon chance or design, will fit in to any part of the science curriculum or if it will remain pre-emptively excluded as

14 *Chamberlain v. Surrey School District No. 36*, [2002] 4 S.C.R. 710; See also, Benson, 2000 and Benson, 2004: 83-98. The former was cited with approval by Justice Gonthier whose analysis on "secular" was adopted by the majority of the Supreme Court of Canada making it the governing decision on point. On other questions, relating to whether the actual decision of the trustees amounted to discrimination, Justice Gonthier's was a dissenting judgement.

"dogma" or "religious belief?" There are various leading scientists for whom an acceptance of "design" is separate from both dogma and religious belief. For example, some have suggested that the extreme improbability of life originating "out of nothing" must lead to the suggestion that "life" was introduced from somewhere else.[15] Yet the possibility of admitting, even for discussion purposes, the notion that design, or some other operative principle other than (or, in fact, utilizing) chance (such as a version of the anthropic principle[16]) is the guiding force

15 An example of this sort of position is that taken by physicist Freeman Dyson; see, *Disturbing the Universe* (London: Pan, 1979) and, with variants, that of Professor Hoyle, above, note 13. In the United States the celebrated decision of Federal District Court Judge John E. Jones III in *Kitzmiller v. Dover*, 400 F. Supp. 2d 707 (M.D. Pa. 2005) http://www.aclu.org/images/asset_upload_file577_23137.pdf (the decision was not appealed from) held that Intelligent Design ("ID") theory:
…aspires to change the ground rules of science to make room for religion, specifically, beliefs consonant with a particular version of Christianity" (p. 29) and, as such, could not form any part of required school science programs (even as an option) without offending American constitutional principles of the separation of church and state and the non-establishment of religion. Moreover, the Judge observed that: "It is notable that not one defense expert was able to explain how the supernatural action suggested by ID could be anything other than an inherently religious proposition. Accordingly, we find that ID's religious nature would be further evident to our objective observer because it directly involves a supernatural designer (at 31).
The Judge found, on the evidence, particularly on the nature of the book at the centre of the case (Percival Davis and Dean H. Kenyon, *Of Pandas and People* (Dallas: Haughton, 1989)), recommended by the school officials, that ID was equivalent to "creationism." The law in Canada (and elsewhere) takes a different constitutional approach than the United States and has imported neither of the central principles of constitutional interpretation relied upon by the Judge in *Kitzmiller*. Starting with a conception of the "religiously inclusive secular" such as established by the Supreme Court of Canada in *Chamberlain* may well lead to a very different approach and result should this sort of case be argued in Canada. For a review of relevant Canadian case law in this area see Iain T. Benson "The Freedom of Conscience and Religion in Canada: Challenges and Opportunities" 21 *Emory International Law Review* (2007) 109-163 (forthcoming) at 124 citing *Big M Drug Mart*, [1985] 1 S.C.R. at 339. In *Big M Drug Mart*, then Chief Justice Dickson stated, "[i]n my view this recourse to categories from the American jurisprudence is not particularly helpful in defining the meaning of freedom of conscience and religion under the *Charter*" (at 341).

16 The expression "anthropic principle" was first used by Brandon Carter in 1973. The "strong" version of the principle is presented in the statement, "The Universe must have those properties which allow life to develop." There are weak and strong versions of this principle but none begin by pre-emptively asserting an ateleological basis for the existence of the Universe or evolution following the origin of life. The literature shows a great deal of argument on the nature and kinds of anthropic principle and their relationship to "design" theories (See, Zychinski, 1996: 115-130). In his widely recognized textbook on religion and science Professor Ian Barbour defines the anthropic principle in this way: "the assertion that the physical constants of the early universe were delicately balanced or "fine-tuned": if they had had even slightly different values, carbon-based life and our presence as intelligent observers would not

behind the universe seems to be foreign to the powers that be in British Columbia and many other places.

Faced with the directives and orders, the Board decided that its refusal to comply would likely result in termination of the Board and appointment of a government trustee. The Board decided it would not serve the interests of the community for this to occur and stayed on and complied with the new directives.

In light of the entire dispute it is an irony that one of the officially listed "resource materials" that accompanied the "revised curriculum" was a short video showing "the life and theory of Charles Darwin … depicted in light-hearted animation." Its title: "Hallelujah Darwin."

4. Conclusion: The importance of the "Abbotsford Over-Reach" for contemporary society:

Historian of Science, physicist, theologian and Gifford Lecturer, Stanley Jaki has pointed out that:

> Although nothing is more needed for making a discourse than the air we breathe, nothing is proportionately less reflected upon than the air itself, be it the climate of opinion or the temper of the age, religious or secular (Jaki, 1979: 20).
>
> It is, indeed, difficult to transcend the climate of opinion of the times and we were, after all, formed within that very climate of opinion so sometimes seeing its assumptions proves difficult but may be essential to evaluating our own assumptions.
>
> Arnold Toynbee, in his monumental study of history and human societies made some important observations about the relationship between science and religion. He noted that:
>
> The truth is that the command over non-human nature, which Science has in its gift, is of almost infinitely less importance to Man than his relations with himself, with his fellow men, and with God... Man's intellectual and technological achievements have been important to him, not in themselves, but only in so far as they have forced him to face, and grapple with, moral issues which

have been possible" (Barbour, 1997: 357). An extended discussion of the anthropic principle occurs in the context of "Design, Chance and Necessity" at 204 - 209 of the same text. One would think this material would be of interest to a curious and intelligent student seeking to understand science and its relationship to important questions both within ethics and political philosophy. If science needs ethics, science needs philosophy and theology – the two disciplines, and only those, are properly placed to deal with the relevant questions of ethics and morals which most reasonable opinion recognizes as important to guide science and the technology to which it gives rise.

> otherwise he might have managed to go on shirking. Modern Science has thus raised moral issues of profound importance, but has not and could not have, made any contribution towards solving them. *The most important questions Man must answer are questions on which Science has nothing to say* (Toynbee, 1957: 99 - 100).[17]

Recognition and description of the proper jurisdiction of science from within science as well as from outside it, will enable a better recognition of the jurisdictions of other subject areas as well. Given the importance of

17 The quotation in context read:

> … a crushing victory of Science over Religion would be disastrous for both parties; for Reason as well as Religion is one of the essential faculties of human nature. During the quarter of a millennium ending in August 1914, the Western man of science had been buoyed up by the naïve conviction that he had only to go on churning out fresh discoveries, to ensure that the World would go on getting better and better.
>
> When men of science find out something more,
> We shall be happier than we were before
>
> [quoting Hilaire Belloc's Newdigate Prize winning poem "Electric Light" from the 1890's]
>
> But the scientist's conviction was vitiated by two fundamental errors. He was mistaken in attributing the relative well-being of the eighteenth-century and nineteenth-century Western world to his own achievements; and he was mistaken in assuming that this recently achieved well-being was going to persist. It was not the Promised Land but the Waste Land that was just around the corner.
>
> *The truth is that the command over non-human nature, which Science has in its gift, is of almost infinitely less importance to Man than his relations with himself, with his fellow men, and with God.* Man's intellect would never have had a chance of making Man the Lord of Creation if Man's pre-human ancestor had not been endowed with the capacity for becoming a social animal, and if Primitive Man had not risen to this spiritual occasion so far as to school himself in those rudiments of sociality that are the intellect's indispensable conditions for performing its co-operative and cumulative work. *Man's intellectual and technological achievements have been important to him, not in themselves, but only in so far as they have forced him to face, and grapple with, moral issues which otherwise he might have managed to go on shirking. Modern Science has thus raised moral issues of profound importance, but is has not and could not have, made any contribution towards solving them. The most important questions Man must answer are questions on which Science has nothing to say.* This was the lesson that Socrates had sought to teach when he abandoned the study of Physical Science in order to seek communion with the spiritual power that informs and governs the Universe.…
>
> If Religion and Science could each acquire humility and retain self-confidence in the spheres in which, for each of them, self confidence and humility were respectively in place, they might find themselves in a mood that would be propitious for a reconciliation; but a propitious state of feeling is not a substitute for action; and if a reconciliation was to be achieved, the parties must seek it through some joint endeavor (emphasis added).

these issues to the necessarily moral enterprise of citizenship and culture, much hinges on how these questions will be answered.

In the surrounding culture, questions of purpose and meaning are important to us as persons. They are said to be key for mental well-being.[18] In this setting, confident and strictly *unscientific* assertions (implicit or explicit) that "the universe is based on chance" or that "we know that there is no purpose behind the universe" such as are present (implicitly) in the curriculum Guideline under review in this article, need urgent re-examination. As they stand they contribute to a growing problem and add unnecessarily to a stance of purposeless materialism.

In the article entitled "Science and Dogma" given at a world Congress on Science and Freedom in 1953, then rector of Hamburg University, Bruno Snell, pointed out that science must be dogmatic in one area:

> … tolerance cannot extend to the enemies of freedom. It is true that the liberal mind is at a disadvantage in the conflict with illiberal opponents, since the fight cannot be pursued by means consistent with the convictions of the liberal outlook. It is all the more important that all those who value the preservation of science – and here I would include not only the scientists themselves, but also the communities in which they live, and which benefit from the achievements of science – should lend their unstinted support to the struggle for the preservation of freedom of the intellect. If we allow science to be lowered to the status of mere technical service, whose functioning is restricted to the discovery of means for the achievement of prescribed ends, we shall sink back beyond the beginnings of European civilization (Snell, 1953: 140).

This article began with a quotation from Michael Polanyi in which the specter of "unlimited secular power" is held up as the result if commitment to key metaphysical truths is abandoned by citizens. It would be fitting here to close the article with a quotation by his son, Nobel Prize laureate chemist from the University of Toronto, John Polanyi who, in an article written in 1994, notes that mankind can be dazzled by the technological successes of science and fall victim to "perverted science". Such perverted science, he writes is:

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18 A Report from the Alberta based National Foundation for Family Research and Education cites Statistics Canada figures showing that suicide increases amongst the 10 to 14 age group in Canada increased 1367% from 1955 to 1995 when population figures are kept constant. Source: December 1998 Newsletter from NFFRE. Of course statistics of this sort do not establish causation but it would simply be foolish not to look for answers in the broadest possible way. Assertion of ateleological conclusions without the right sort of evidence is irresponsible – whether such assertions are *implicitly* or explicitly asserted.

> … the invoking of the authority of science to justify inhuman behaviour. For it is this that truly characterizes the century that is coming to a close…the central perversion in all this [misuse of science] is the proposition that science operates in isolation from the remainder of human experience. When, for example, the scientist narrows his field of view to one molecule, he is regarded as doing science. In fact, this describes only an aspect of science. The scientist is in the situation of a swimmer who, holding his breath, plunges deeply to examine the sea- bed. Such activities, though necessary, must be temporary. Before long the scientist must resurface in order to integrate his experience with all that he knows of the world through every avenue open to him – including his experience of life, literature, religion and art. It is only then that his findings can illuminate thinking…Far from being mechanical and unassailable, science is redefined in the furnace of criticism. Tolerance of dissenting views, and open debate, are the very stuff of science (Polanyi, 1994: A21).

What occurred in British Columbia in the Spring and Summer of 1995 and what persists to this day, in the Ministry of Education's express exclusion of certain matters from mention in the biology curriculum in the public schools, is an example of ideology under the guise of science; an example of what Lois Sweet has called "overzealous secular fundamentalism" (Sweet, 1997: 211).[19] The wish to dominate alternative explanations is a common trait and there is nothing that exempts scientists from this human failing.

If our culture, like all culture's dominated by technology, is to remain free and flourishing, then our science must be appropriately tempered by questions that come from beyond science. Humans are free to err but do so to their cost. Just as religion or philosophy can over-reach and infringe upon the proper place of science, so can science over-reach and infringe upon the proper places of philosophy and religion. It is essential, therefore, if we are to maintain a proper concern for humanity and the humane (as John Polanyi urges, above) that contemporary scientists in fact identify and reject anti-religious or anti-transcendent biases where they appear and seek to inform science both internally and externally with lines of thought and other disciplines that will humanize science.

When scientism[20] seeks to include or exclude what it can neither prove nor disprove under the guise of science it must be corrected by other disciplines and within itself by a deeper conception of the richness and limitations of

19 The Abbotsford biology curriculum dispute is discussed at ibid., 208-212.

20 Scientism is the inappropriate understanding of the nature and proper role of science. A useful study of the antecedents of the separation of techniques from purposes and how that touches on the questions of scientism may be found in Aeschliman, 1983.

science and scientific method. Civilized society requires that techniques, whether they be scientific or otherwise, are circumscribed by moral boundaries. These moral frameworks have both an internal and an external aspect.

The "pure" scientist, in selecting areas for research or in carrying out certain research, must, on occasion, ask moral questions to ensure that the techniques are, themselves, morally appropriate. These questions require both internally and externally a notion of what are the proper ends for human endeavors – and that, in the broadest sense, raises the questions about what purposes (or "designs") exist for human beings.

Design, like the existence of God, love, human dignity or justice might well be beyond the proofs of science. But like justice and love, human dignity and God, or even the idea of *chance itself*, design cannot be *dis*proven by science. We should introduce discussion about the possibility of "design" *alongside* "chance." Failure to note that there are competing theories for key notions such as origins, evolution, design, chance or intelligence show that a certain kind of arrogance, prejudice or fear are dominant and that *scientism* has trumped proper science.

In this regard, it is important to note a certain kind of scientific fundaentalism that is the counterpoint to a certain kind of religious fundamentalism. An earmark of this scientific fundamentalism is that it fears informing science internally or externally by philosophical or theological questions as much as the religious fundamentalist fears informing theology or philosophy by scientific insight. Both fundamentalisms are culturally destructive and to deal with them both we must deal almost as much *with the psychological barriers of the personalities involved* as with the theoretical arguments.[21]

Science and law must not be the unwitting tools of a so-called "secular" (better termed "secularistic") ideology. We must reconsider the proper jurisdictions of science, philosophy and religion and learn that humility and proper tolerance are excellent companions for those committed to honest scientific investigation and the intelligent design and execution of science courses.[22] Only this sort of approach enables science to maintain its right and proper place in a society and offer what benefits it can.

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21 New York University Professor of Psychology Paul C. Vitz, has written perceptively about the relationship between psychology and religion and the problem of disciplinary overreach: see, (Vitz, 1994). He has also examined the interesting link between a certain kind of militant atheism and its psychological roots, (Vitz, 1999). Involvement in any in-depth way on the issue of what is and is not appropriate material for a science course on "origins" and "evolution" soon brings one into contact with both sorts of what the author has termed "fundamentalists" of the atheist, agnostic or religious varieties; each sort seems to suffer from similar but differently orientated disciplinary myopia.

22 Templeton, 1981: 3 has written:
It is also in humility that we learn from each other, for it makes us open to each other

It seems obvious in light of the arguments, above, that we cannot ultimately answer the question of the role of science from only a scientific perspective. Nor would it seem wise for us to view disciplines as hermetically sealed-off from other areas. In fact, it seems that many of our current problems in the academy and in life are caused by a fragmentation of unitary knowledge or approaches and an all but complete failure to ask questions about how all the disciplines together form a unified whole that must be kept together for the good of society itself.

This has long been recognized as a problem and great historians such as Toynbee and scholars of science and history such as Michael Polanyi and Stanley Jaki have noted the importance of keeping science related to metaphysics (philosophy and religion). If this is not consciously understood to be necessary, the technical domain of science will not be informed by the moral questions of the day since morality is not internal to the science quest itself. At certain points in history scientists have had to ask themselves whether either the means they are to employ or the ends they seek are morally acceptable. When this step is circumvented or overlooked grave consequences can result.

The experience in British Columbia certainly offers guidance for other jurisdictions wrestling with these problems. The current "resolution" in place in British Columbia high schools is not one that could be considered a proper conclusion for science, philosophy, religion or society.[23] It remains for more enlightened educators, and better scientific thinkers and politicians, to make the necessary changes and for those in other jurisdictions to learn from the mistakes continued over the last decade in Canada's westernmost province.

Appendix

Dr. Peter Hodgson's Response to Iain Benson's Article

Toronto, July 9, 1999

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and ready to see things from the other's point of view and share ours with him freely. It is by humility that we avoid the sins of pride and intolerance and avoid all religious strife. Humility opens the door to the realms of the spirit, and to research and progress in religion.

23 There is no reason that the teaching of evolutionary theory, its strengths and weaknesses or unexplained areas, cannot co-exist with other theories. That evolutionary theory itself can have widespread religious support may be viewed by developments in the United States where over 10 000 clergy have become signatories to a "clergy letter project" stating their support for Darwinian evolution and its co-existence with religious convictions. See: http://www.butler.edu/clergyproject/clergy_project.htm. As with understanding the proper relationship between differing belief systems, false dualisms (such as "religion OR evolution" "creation OR science") are some of the first hurdles to be overcome in any recovery of inter or trans-disciplinary relations of the sort argued for in this article.

I have taught physics and mathematics at the University of Oxford for over forty years, and no one has ever told me what to teach. It is taken for granted that I will teach the truth to the best of my ability.

If I were a biologist I would teach the evolution of plants and animals as part of that whole stupendous process going back to the Big Bang, and possibly before that. The development of our understanding follows its own internal criteria, independent of external influences.

If a student were to ask me where God comes into all this, I would say that as a Christian and a Catholic I believe that God created the universe out of nothing and continually holds it in being. The task of science is to study that universe in all its details. These theological beliefs leave me totally free to study the universe by the methods of science.

If someone tells me that I must also teach that evolution is a chance process, that the universe came into existence by chance, and that there is no God, I would reject this as a series of atheistic beliefs that are in no way entailed by the scientific data.

If someone says that he is a Creationist and congratulates me on my belief in Creation but says that I have made a mistake about the timescale, that in fact the universe was created 6000 years ago because the Bible says so, I would be obliged to say that this is contrary to the scientific evidence. It is not acceptable either scientifically or theologically to say that God created rocks with fossils already inside them. This is rank anti-science. I would add that I believe that the Bible is divinely inspired, but that if it seems to say something that is definitely disproved by science, then this means that we have misinterpreted the Bible and must think again. This position is fully consistent with the teaching of the Church.

If anyone then tells me that as a result of some law I must teach biology in this way or that, I would regard this as an assault on my professional integrity. The only possible response that I could make is to tell him, as politely as possible, to get lost.

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