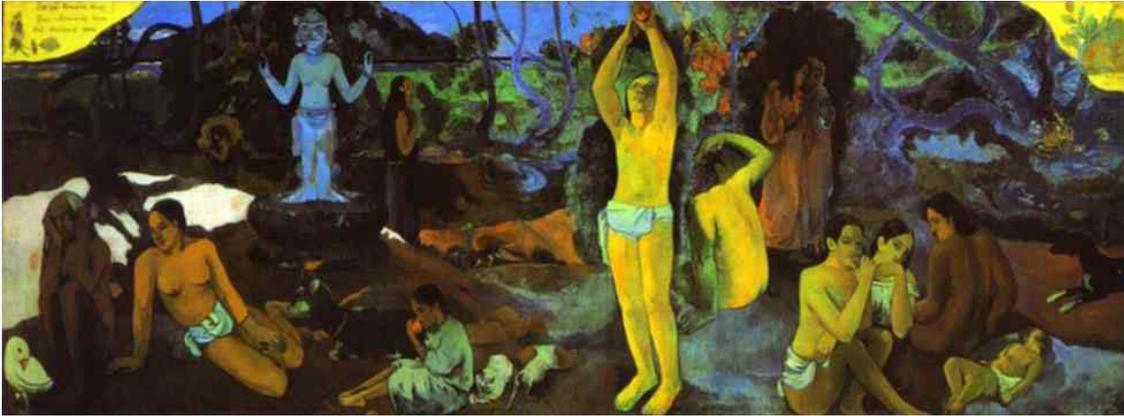


Religion, science, and mind

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Paper contributed to the Pari roundtable on
The Next Horizon: Re-examining Deep Values in Religion & Science
Pari Center for New Learning, Pari, Italy
September 10-14, 2004



Paul Gauguin: *D'où venons nous? Que sommes nous? Où allons nous?*

First, a personal story

David Peat (n.d.) and I find ourselves on the same wavelength. Before I read David's contribution '*Creator and creation*' posted on the Pari Web site in preparation for this dialogue, and thinking about where to start the cycle of inquiry, I felt inspired by the same well-known painting by Gauguin and the questions it raises: "Where do we come from? What are we? Where are we going?" So fundamental are those questions to my own being, and so fundamental are for me the visual arts, that a reproduction of that painting has, for a long time during my life, decorated one of the walls in our house.

I am a scientist who grew up in a family of practicing Christians of protestant persuasion. The questions raised by Gauguin's painting were key to some of the discussions we had around the dinner table at my parental home. Discussion was common in our family. To non-family members it must sometimes have sounded like we were always quarreling. Questions of an ethical nature, leading us to think deeply about what is good and what is bad, and what to do in particular circumstances, were not alien to such debate. The fact that, as a child, born in 1938, I had experienced World War II—the bombardment of Rotterdam being the first, non-traumatic, recollection of any event in my life—provided enough food for thought to nourish ethical concerns. That war ended with a big bang over Hiroshima, prompting my elder sister and me to consider, as we discussed the event over dishwashing, whether the splitting of atoms actually resulted in the victims of the blast being split into equal halves. Though I had seen enough of the horrors of the war, I felt

only slightly uncomfortable raising such a profound scientific question without being deeply troubled by the human misery occasioned by the explosion. Thinking back of that kitchen conversation, I cannot blame the generation of physicists that preceded mine, to have been excited about more pertinent and better formulated scientific questions while working in such places as Los Alamos, and only after the excitement was gone, on occasion, to realize what had happened and what horror they had caused, as was, for instance, the case of Richard Feynman (Gleick, 1992).

The book of Genesis, read to me by my parents in a children's version and explained in more detail at the primary school I attended, I found fascinating as a small child. It gave sense to my life as it put my existence in the perspective of a larger reality. It satisfied, to an extent, the query inherent in the first of Gauguin's three questions. At that age, the book of Revelations was too difficult for me. No wonder then that it wasn't part of the children's bible and was only read to me when we children had developed the linguistic ability to appreciate the official version of the bible translation in Dutch and after we had been exposed to the reading at that advanced level of those parts of the bible we were already familiar with at the level of the children's version.

I remember vividly the time—I must have been around 13 years old—when my father first read the book of Revelations to us. It sounded like music to my ears, a music that I later heard again when I discovered J. S. Bach's cantata *Wachet auf ruft uns die Stimme*. My fascination about the book of Revelations wasn't so much that it gave an answer to the third of Gauguin's questions. Quite to the contrary, it excited me because it raised so many other questions, questions that weren't too distinct from the ones that emerged from my passion to observe the night sky, drawing and consulting maps of the surface of the moon as it was then known to us and of the system of planets and comets revolving around the sun. The great wonder that I discovered was that it was possible for human beings to know things even if it wasn't possible to be in direct contact with them. After all, no one had yet been on the moon and the prospect that it would ever happen was mere science fiction, a fantasy, a dream. Of course, I dreamed such dreams, and made drawings of vehicles through which it would be possible to reach the moon, improving on Jules Verne's earlier design.

The idea that you can know and think about things you can't observe directly was reinforced as I experimented with radio tubes and other components of electronic circuits and read, in books I found in the public library, about how such devices worked. I couldn't see electrons, but I knew they were there, how they moved from cathode to anode, and I could observe their effect without seeing them. Was there a distinction between the story of science and that of the bible? For the time being it didn't bother me too much. I was sufficiently happy that at least the two ways of storytelling seemed to converge on the idea that one could know about invisible things, that such knowledge provided larger conceptual frameworks that gave direction to my queries about the origin and purpose of my existence, and, most importantly, that they instilled in me a supreme sense of beauty.

Perhaps this sense of beauty, as I found it in the wholeness of things, visible and invisible, climaxed when I read a book about the evolution, not just the evolution of the biological world, but of the entire universe. I spoke about it at the boys' club I was a member of and was, as a consequence, straight away promoted to the more senior section of it, where I could meet with youngsters as old as 20 or more years. My questions, according to the club's leader, were above my age and I would find better discussion partners among my older peers. The promotion was immediate. Only later did I realize that an important motivation must have been that it avoided that the younger boys, those of my age, could have become confused. Back at home, I explained my thoughts to my parents. My father raised concerns about the discrepancy between my evolutionary worldview and the vision that, as he saw it, emanated from the books of Genesis and Revelations. Personally, I saw no contradiction and I told him so. My mother expressed the opinion, addressing my father's concern, that he should "let that boy go on and find things out for himself." And so I did. I'm still grateful to my mother, who was a deeply religious woman, for that observation.

Combining religious and scientific visions never became a problem as I progressed on the path of becoming a fully-fledged theoretical physicist. In fact, I had no problem integrating apparently even higher levels of complexity in constituting my own being in the world. I adore and practice music, am fascinated by the visual arts and particularly passionate about sculpture and architecture, love poetry, read fiction and practice philosophy. As I see it, these are all complementary ways of being that one does not necessarily have to experience in a mutually exclusionary fashion. The fact that we have difficulty accepting complementarity in the experience of different levels of reality rather than their mutual exclusivity simply reflects yet another reality: We have been overly exposed to and grown up to understand the world in terms of Aristotelian logic. Well, Aristotelian logic, the logic of the excluded third, provides a powerful framework for thinking and connecting ideas. However, the fact that it is able to do that, and do so in a powerful manner, does in no way mean that it is all encompassing. Nicolescu (2002), following through on the ideas of Lupasco (Badescu & Nicolescu, 1999), builds a strong argument to overcome the traditional divisions in our various domains of knowing and experiencing by viewing the world from a transdisciplinary vantage point, based on a logic of the included third.

But, before you read this as an apology of religion, let me add, to conclude this personal story, that, despite my refusal to accept the categorical incompatibility, as claimed by some, of religion and science, I did withdraw formally from the church in which I grew up when I had reached the age of a young man and had meanwhile embarked on the beginnings of my scientific career. That withdrawal had nothing to do with the pseudo opposition between science and religion. On the contrary, it had everything to do with my aversion of the very real opposition between the actual behavior of human beings who claim to be inspired by religion to the extent that they think they know, and are consequently able to tell others, what is right and wrong, and who yet consciously insist on doing all of the wrong things, like hating their fellow human beings, killing them, or simply letting them unnecessarily die of poverty and disease.

Why did I start off telling a personal story?

I started off telling a personal story not because I felt my case is particularly noteworthy or representative. Like any story of human existence, it is unique. However, while it is unique, it has things in common with the life of many other ordinary, and even not so ordinary, people. As members of the same species we all have in common, shared through the mechanisms of hereditary transmission, features of molecular, cellular and organic-functional organization, embedded in our bodies—those pieces of bounded matter-energy that we identify with and of which we say ‘this is me’ for an almost infinitesimal frame of time during the evolution of the universe—that allow those same chunks of matter-energy to reflect upon themselves, asking questions about themselves and about the world in which they live. In the course of the short history of human evolution, we have invented rationality as a superior means to aid such reflection, and, as McWeeny (n.d.) argues in his contribution to this dialogue, mathematics as a superior language to express, communicate and interact about rational thought. Those inventions have greatly helped science—the art of knowing and the discipline of contemplating how we know and what it means to know—advance. Depending on what we do with what we know, the advancement of science may also result in human progress.

If, in fact, such progress occurs, depends on how we visualize our futures, not only at the level of us as individuals, but equally at the level of the communities of which we are part and, eventually, that of the human species, including that species’ habitat, which, modestly, we may consider to be the universe. So, from science we are back to questions of good and bad, right and wrong, and the various compromises we may strike between those poles. But isn’t that the domain of religion? So, isn’t religion a necessary complement of science and don’t we always need to have the two together if, as a species, we want to stay on course?

Like science, I hypothesize religion, as a conscious way of being, to have emerged during a particular phase of the evolution of our mental functioning. One can well imagine that, after religion emerged, it gave comfort and strength to those individuals who developed a religious mindset. Such individuals would see themselves as more comprehensively tied in with the larger whole of human destiny, giving them a stronger sense of purpose and thus an evolutionary advantage over those who had failed to develop the same mindset. Moreover, as religion became institutionalized within particular communities, it developed, as Shermer (2004) argues, into an environment for the codification of moral behavior. This helped certain portions of humanity, who derived specific evolutionary advantages from codifying the behavior of their members around particular principles in the context of binding religious systems, advance beyond the rest of the species. Selfish as religious communities are, their thoughts about the advancement of humanity seem to be either predicated on the assumption that humanity’s interests are best served if all others adhere to the principles of that community or they are based on the assumption that the only part of humanity that matters is the chosen part. At best they will tolerate, i.e. not act violently against, others who wish to adhere to a different set of principles. Organized religion—particularly the great monotheistic religious systems—has generally failed to develop a mindset accepting of diversity. It has thus equally failed to recognize a

key ethical concern, namely the well being of humanity as a whole in a planetary perspective, based on diversity rather than uniformity.

There is nothing inherently bad about religion

Of course there is nothing inherently bad about religion, as long as religion is not interpreted in the sense of unquestioning adherence to a particular faith. McWeeny (n.d.) explains very well in his paper the fundamental difference between acts of faith in religion and acts of faith in science. Science is, as Bronowski (1978) argues, always concerned with the question ‘Do we do it right?’ It consists of constant scrutiny of and debate about its own methods and the ways those methods are being applied by the members of the scientific community. Quite to the contrary, faith as promoted by most of organized religion, comes down to advocating ‘knowing without scrutiny,’ i.e. unquestioned adherence, the conviction of righteousness.

Nonetheless, the roots of religion are in the experience of belonging, of being connected to, of being bound back on, a sense clearly present in the literal meaning of the verb *re-liare*. This experience is not alien to the mindset of the passionate scientist. I contend that, historically, the better outcome of the religious experience has been the development of science rather than the emergence of organized religion. Eliade (1982) argues in this connection that, while religious experience is universal, it is not necessarily connected with a given organized religion. Thus, the religious experience may well be in conflict with the religion as an institution.

There is nothing inherently bad about science either

. . . and perhaps there are actually some good things about it

So, going back to the roots of religious experience, my hunch is that the sense of belonging is actually an experience with potentially positive ethical consequences. That sense is well expressed in mystic poetry, I believe, and differently, but equally well, in the visions we owe to the development of science. It is this sense of belonging that may eventually help us to overcome our propensity towards arrogance and selfishness as isolated individuals. I thus believe that there is goodness in efforts to transcend the schism between religion and science and that the scientific mind should be developed, inspired by the deep values that are at the origin of both religion and science and informed by the powerful history of the development of scientific thought. The dialogue between science and religion this would entail has necessarily a transdisciplinary basis. Not much of this spirit is, generally speaking, visible in what is currently happening in schools under the guise of science education, nor is it concomitant with the way in which science is often represented in the media. Very little of the true spirit of science, the continual debate on the question ‘do we do it right,’ is reflected in how science is being taught in schools. To the extent that structured learning—which is what supposedly should happen in school—has a role to play (and I believe it has), a much stronger focus on the development of the scientific mind is required instead of the almost exclusive

concentration on learning the facts of science. And when I say ‘science’ I mean ‘science,’ i.e. the art of knowing, and not merely subjects like physics, chemistry or biology.

Some loose ends: Theses and questions for discussion

1. When people active in different domains meet, as is the case of this Pari meeting, they sometimes use the same words but attribute totally different meanings to them. One such word is ‘knowing.’ Science is the domain of human activity that, by definition, is concerned with the creation and validation of knowledge. That probably shouldn’t give it the right to monopolize the meaning of knowing, but science certainly has an obligation to enlighten others on this issue. In any case, I believe it will be in the interest of this discussion on ‘new horizons’ that goes over the heads of traditional divisions to be as clear as we can about the meanings of the key words we use.
2. Among the deep values of science is the shared desire of all who adopt the scientific mindset not to fool themselves, not to be fooled by others, and not to mislead, willfully or unintentionally, their fellow human beings. This is a great good, particularly at the present time. While on occasion a scientist may sin against this shared value, the scientific community as a whole practices what it preaches. It has a well-developed set of mechanisms to scrutinize itself and to avoid that unsupported claims are being made. Religion is frequently at the opposite end of this value. Its claims to truth have often led to misery and mass slaughter. Most religious individuals, though, are not in favor of propagating misery or death. Yet, when organized in large systems, phenomena like crusades and holy wars tend to emerge. What can be done to correct this situation?
3. One single event, such as a walk alone in the mountains, can lead to both religious and scientific inspiration. It can also lead to other kinds of inspiration, such as of a poetic or artistic nature. Does this mean that such experiences have things in common? Not necessarily in my view. However, they may occur in one single individual and prompted by the same event on the same occasion. Numerous instances are known where the conviction that things should be beautiful has led the way to the creation of new knowledge. In other words, an artistic inspiration can lead to scientific discovery. Similarly, as is particularly known from the earlier history of science, the desire to praise God—whatever the attributes the scientist may have given that entity—has led scientists to look for harmony and wholeness in conceptions of the universe. Examples are also known of poetry, visual art and music that are inspired by views emanated from new scientific visions. In religion such visions have led to secularized hybrids of religious insights. I believe that such mutual inspiration is good and not to be feared. The opposition that is claimed to exist between religion and science may be related to poor understanding of the true nature of both science and religion.

4. I owe to Ralph Kronig (1969), the man who taught me physics, the observation that one of the areas in which humans distinguish themselves from other animals is in the awareness of their mortality. Such awareness is, according to Kronig, the basis for humor, religion and music. It is probably true that science does not owe its existence to this same awareness. However, as science developed over time it has led to insights into the fundamental questions of human existence that may provide similar consolation in the face of death as the insights that can be grouped under the categories of humor, religion and music.
5. Religion is not the sole player in the realm of ethics. It has been a major player in this area at crucial junctures of the development of humanity. I believe it no longer is and that it often stifles the dialogue about ethics. Much will be gained in my view by contemplating, henceforth, ethical issues from a transdisciplinary perspective that transcends the realms in which we have divided the human experience. Such divisions have been created for convenience, not to become obstacles. We have arrived at a phase of humanity's history where it does not only make sense but actually becomes imperative to the solution of the world's problems to break down some of the barriers we earlier created.

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