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The author, who is a physicist, engages in theological conjecture suggested by some of the concepts of his discipline, demonstrating the fruitfulness of creative appropriation of ideas across disciplinary boundaries. Two futuristic scenes contrast possible developments of the Church within a technological society.

Junika stepped into her pew at the New Crystal Chapel in the City of the Angels, and immediately her personal reality space there alongside other worshippers changed chameleon-like to the rhythm of her own thought patterns. Images of ancient and modern scenes flashed before her retinas in pace with the powerful voice breaking open the timeworn words of a ritual performed long ago by priests in black robes. Pleasurable sensations arose within her as the bio-computed virtual Eucharist reached its peak with the words invoking the Holy Spirit to come upon these gifts. They were followed by a quick sense of satiation. Stepping out of her space, Junika glanced at her watch, as if her appointed worship time today would be any different from last week's. "There it's done, fifteen minutes and I feel closer to God." Out on the street humanity surged like New York on a sultry day. Those who could afford the city and what modern life had to offer walked with the confidence of a Centurion, while far off in the sun parched valleys lived the masses who were about to inherit the earth.

The irony of this futuristic vignette is that the evangelicals, with their wealth and their zeal for a personal encounter with our savior Jesus Christ, evolved their churches into a technological, individualistic ritual society that idolized the encounter itself, stripping it of any meaning, reality, faith-community or purpose. They fashioned their hi-tech Jesus by introducing one technological innovation after another. Until the upbeat evangelical churches turned into "cyber-cafés" of virtual encounters with the divine, and into real profits with the bank. Even the growing mega-churches in Asia converted to this techno-religion, owing to its increased efficiencies and its use of local technology. During this same period, the Roman Catholic and mainline Protestant churches managed to fill only a few splendid cathedrals with tradition-bound conservatives, while the radical sects of Roman Catholics, Anglicans, and Protestants lived among the burgeoning masses of the poor, whose existence hovered tenuously between the potential for another disastrous cereal-crop failure, and the ability of the bio-pharm labs to manipulate the crop genetics one step ahead of the Divine plan. The question is, will technology ever keep us one step ahead of God, or is everything we call progress just a gossamer-thin illusion for our radical separation from that which is both really true and truly real? Can science and religious faith coexist in a "both-and" proposition, or do we sail on a collision course where the objects of worship become technological, media-generated radical isolation, while wisdom and faith become known only to those whose lives derive directly from laboring on the land?

Introduction

This essay will cover an enormous range of scientific ideas in an attempt to establish a working dialogue between two fields that are rapidly diverging, at a time when the world desperately needs a convergence and integration of thought and ethics. In the course of these Annie-Dillard-like musings, two edges of contact between theology and science will be explored. One
is revelational, and the other involves creation or the “Creative Power,” as Dorothy Sayers puts it. The science fiction opening and closing paragraphs frame two distinctly plausible futures. The first presents a culture that continued on today’s course, to become alienated and fragmented by technology. The closing story shows another plausible future, where social relationships reach a more egalitarian level, and humanity’s relationship to knowledge has shifted away from today’s narcissistic, self-interested sphere, toward a more humble, respectful position in relation to Divine mystery. The aim of this paper, then, is to demonstrate the plausible existence of two common boundaries shared by science and theology, in hopes of kindling further dialogue along new lines. A longer-term goal of this general effort involves the mission of the church itself, in getting both sides to incorporate Divine mystery into their schemas, and to lead the culture in its understanding of the place of the Creative Power, not only in religious processes, but in the scientific method itself. The harvest is plentiful— and the laborers are plentiful. Where are we to begin?

**How can scientific theories apply to theology?**

Casting about for an overlap between science and theology, we haul up from the bottom of physics the detritus of ideas examined by philosophers and theologians from Newton to Chopra. Many of these ideas have been considered by modern philosophers and theologians with the intent of working physical theories into a systematic framework for the unscientific fields of theology or philosophy. We will stop far short of a systematic approach, hoping only that a review of some of major advances in the sciences may help point our hearts and minds in the right direction. We should note carefully, however, that physical theories are not used to explain theology, interpret scripture, or to explain human nature. Rather, what can be gleaned from the major scientific advances are ways of looking at the cosmos; and from that point, some theological conjecture or, at best, extrapolations can be offered.

The first stop is the idea of invariance. As Einstein first conceived of special relativity, spinning his well-known railroad car explanations, he must have been troubled by the idea that fundamental physical properties such as distance, time, and mass vary or change quantitatively depending upon the observer’s frame of reference. Simply put, a yardstick will not be measured as thirty-six inches in length by an observer traveling at a velocity close to the speed of light relative to the location of the yardstick. It turns out that in the model of the universe explained by special relativity, only a handful of all the hundreds of basic physical properties of the universe are found to be invariant in this sense. In a more poetic sense, however, ideas such as “terra firma” and the so-called “truth claims about God” need to be critically examined in the humbling shadow of one fact—namely, that there are very few things in the universe that are absolutely true and unvarying in all times and in all places. Perhaps Pilate was onto something when he asked Jesus, “What is truth?”

We should avoid the common trap of extending the idea of relativistic invariance in the world of physics to a relativizing of ethics. Instead, invariance can be used as one of many chains that bind and constrain epistemology or what we can know about the universe.

Two other links in the chain that we can borrow from the physics of the early twentieth century are the famous Heisenberg Uncertainty Principle and the Gödel Incompleteness Theorem. As Einstein wrestled with the failure of classical (Newtonian) physics to explain the phenomena of relativistic variations when observer and observed frames of reference move relative to one another at nearly the speed of light, Werner Heisenberg and others wrestled with the failures of classical physics to explain phenomena of very small, atomic-scale interactions. In brief, on a softball field, we can set up an experiment to measure simultaneously the position and
momentum (mass times velocity) of a softball to any degree of precision desired. The accuracy of making such a measurement is limited only by the experimental equipment we use. If we try to make the same measurements on an electron traveling around a hydrogen nucleus, we find that there is a quantitative barrier beyond which we cannot more accurately and simultaneously measure the position and momentum of the electron. No matter how accurate our experimental apparatus becomes, there is a fundamental, physical limit to the state of our knowledge even about one of the simplest physical systems of all, the hydrogen atom.

Contemporaneously with Einstein’s and Heisenberg’s work, the mathematician, Kurt Gödel posed his Incompleteness Theorem, stating that any axiomatic mathematical system (such as Euclidean geometry) will always contain questions that cannot be proved or disproved on the basis of the axioms within the system. Even though some have noted that only mathematicians and God can play with truth, Gödel’s proof forces mathematics to take its place alongside theology and other disciplines as “unfinished objects,” or fields where knowledge and truth may be necessary, but can never be sufficient. There will always be more.

Given these conjectures regarding the limits of knowledge, then towards what end is knowledge being pursued? When we study organic chemistry, we learn about the chemical bonds of outer electrons described as “pi” and “sigma” bonds, which are constructed mathematically as “probability clouds” describing where the electron is likely to be. In a sense, these pi and sigma bonds are really “clouds of unknowing,” where scientists are comfortable within the limitations to their knowledge. After all, the theories are good enough to develop new plastics and pharmaceuticals. Why worry about truth and completeness?

At the same time, rational, systematic handling of theology tries to construct complete, theologically dogmatic descriptions of the divine, often without incorporating mystery. We may have stumbled upon

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an irony here, where the scientist lives with mystery and unknowing every day, and even incorporates theoretical formulations that deliver useful benefits to humanity. The theologian, on the other hand, presses on, hoping to construct a sufficient, dogmatic system, sometimes avoiding mystery as much as possible.

Departing from the arena of epistemology, we find more parallels between the use of system approaches in thermodynamics and biology and religious communities. Without reviewing the histories of science in two diverse fields, one of the important ideas that emerged from the late nineteenth century onwards was that populations can be modeled in useful ways. Groups of things can be measured, and theories can be developed to explain phenomena ranging from the pressure of a gas in a balloon to the fluctuations of snowshoe hare populations in the Arctic. In Christian ethics we find that “there is neither Greek nor Jew, slave nor free…” We are commanded to love our neighbor as ourselves. We are equal as individuals in the eyes of a loving God, but populations and communities matter, too. We may all be equal spirits, zipping around with Brownian motion in the Divine plan; but just as the aggregate behavior of gas molecules causes a phenomenon we call “pressure,” it is the community of faith that creates meaning. The Christian ethic is full
of paradoxes. We are equal in the eyes of God, but the shepherd will go to any length to save the one lost sheep. Individuals are saved by grace now, but at the end of time, all will be judged.

Two edges of contact between science and theology

Revelation

In a poetry reading in Cambridge last year, Robert Bly observed that many new science Ph.D. graduates today have a passion to “knock off” the leading theorists in their respective fields. The sense that a scientist stands on the shoulders of her or his predecessors seems to have been replaced by a prevailing attitude of narcissism, fueled by fear. Given the pressures of modern society and academia, the presence of fear that leads to narcissism may not be unique to the scientific disciplines. The fear involved in this process may involve a gnawing suspicion that there is more, that the theory is not complete or sufficient. The fear may involve personal issues such as perfectionism, elitism, or egoism. The bottom line of a quest for knowledge and insight, whether in physics or theology, is that in the presence of personal fear, the end towards which knowledge is pursued becomes pure narcissism, a building up of the self without regard for others—or worse, a building up of the self at the expense of others. If we seek knowledge and insight courageously, what is the starting point of the quest? and where does it lead?

The scientist starts with a belief in the ability of the rational, human mind to reach new insights and gain new knowledge. From that basis, the scientist proceeds with an understanding that there must exist a formal way to explain the observed phenomena. In spite of these two layers of rationality, and the impressive achievements of the past century, the courageous scientist will ultimately acknowledge that Gödel was correct: that there is always more than the theory can explain. The courageous scientist will become inexorably drawn from a position of certitude and confidence to another place of uncertainty and mystery. The courageous scientist will move from what is rational to what is not rational. The end towards which this scientist pursues knowledge then becomes part of the mystery, as well. The revelation of that which is more, or Tillich’s “ultimate being,” emerges from the scientist’s peering into a universe that is full of unknowables. Thus, science and theology converge on one edge of revelation of the real source and font of all knowledge. It all begins with reviewing what we do not know and cannot ever know. Can we see God face to face and live?

Creation

The scientific method is nonlinear; it loops endlessly, repeating a cycle of hypothesis, experiment, data collection, test of hypothesis, and the emergence of more questions that lead to yet another hypothesis. In this looping, the scientific method works largely in a sphere of rationality. When great discoveries are made, and bold leaps taken by leading scientists who permanently change the paradigm for a field of knowledge, those leaps move into mystery and a “non-rational” sphere. The imaginings of Einstein, Heisenberg, and Gödel would have seemed wildly speculative or even preposterous to some in their day.

The “religious method” or liturgy, is also nonlinear, looping endlessly in a cycle where people gather together, praise and give thanks to God, enter the mystery (of a sacrament); and at the end of the liturgy the people go out into the world to return again at a later time, often with more questions. Unlike the scientific method, the religious method loops largely within a non-rational
sphere. Mystery is already present, but what is lacking is empirical data. When saints, sinners, and everyday people begin to grasp the implications of the liturgy in their daily lives, they become motivated by their ethical considerations to perform works of justice. These works of justice are the empirical data of the religious method, and in a fashion that is complementary to the scientific method, the religious method starts in a non-rational sphere and moves to the rational, where faith propels works of justice.

Scientific and religious methods then form a complementary pair of processes, sharing a common boundary of creative power. It takes creative power to have scientific insight as well as ethical insight. In both methods, a community creates the meaning. In spite of beliefs to the contrary, the scientist really does stand on the shoulders of a long tradition of discovery. In addition, the scientist is accountable to a community of peers, where the interpretation often emerges from the dialogue. The result of courageously moving across the two-way-mirror boundary from non-rational to rational (or the reverse), is the accumulation of new knowledge for one person; for the other, justice. Anselm once described theology as “faith seeking understanding.” Conversely, perhaps science can be considered as “understanding seeking faith.”

Conclusion

The information explosion and the accelerating pace of life affect nearly everyone on this planet in various ways. Family farms are giving way to agricultural factories; “concert-A” is higher in pitch than it used to be; people in England and North America are measurably affected by 50- and 60-Hertz power grids; more books are published in a year than all of the Western world’s output up to the nineteenth century, etc. To what end is this increased pace directed? To what purpose is the accumulation of more knowledge with less wisdom?

Stopping by church after attending her Oil and Gas Resource Management Board meeting, Junika waved to the laborers heading home from their work in the villages. All her life the church was there as a light for her and her community, setting up medical care, family care for children and the elderly, organizing groups to work with industry and government. Decades earlier, the four horsemen of the post-millennial apocalypse had changed the world forever. Global epidemics coupled with crop failure from intensive monocultural practices had both taken place, along with economic implosions in the Orient and environmental disasters in Europe. People could no longer ignore history or community. People realized that complex problems could not be solved by reactionary conservatives with clever one-line analyses like the “sound bites” of an earlier era. Science and technology no longer enjoyed their radical isolation from the arena of human needs and values. There again, the highly trained clergy of the church re-entered the world of business and science that it had ignored since the thirteenth century. Business now operates with an integral understanding of the sanctity of human life and the value of communities.

Tonight was Junika’s turn to lead the community in worship and the weekly meal. She looked forward to this special meal tonight, when the laborers sat down next to the merchants, students, families, and guests. The pace of the worship and the meal together reflected the pace of a world with an ancient but new-found purpose, taking one delicately slow step after another towards the Divine.

Dis-integration is far easier than integration, because both human and natural systems have a built-in tendency towards disorder and chaos in the absence of an external energy source. In communities of faith, Divine and human love is the energy countering disorder; but the powerful economic forces of contemporary Western culture have hammered the Church into irrelevance. Perhaps a mission of integration of theology and science will enable ends, motives, and purposes of the culture to be brought to the table alongside the commandment to “Love your neighbor as yourself.” It is time for a new hammer.
Endnotes:

1 All it takes is the personal experience of one earthquake of Richter magnitude 6.0 or higher to dispel this medieval notion.
2 Literally, “the work of the people.”
3 Also known as the “undecidability theorems.”

Author’s dedication: “To my late uncle, Dr. Robert J. Moon of the University of Chicago, whose work on the Manhattan Project, whose radical Christianity, and whose subsequent efforts towards world peace and nuclear disarmament have been lifelong inspirations for me.”

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