On Taking Vows in Two Priesthoods, Scientific and Christian

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I come as a practicing scientist and teacher and like most teachers I collect exam questions. Two of my favorites are as follows.

1. You have been provided with a razor blade, a piece of gauze, and a bottle of alcohol. Remove your appendix. Do not suture until your work has been inspected. You have fifteen minutes.

2. Define the Universe and give three examples.

The question I pose to you tonight is somewhere in between these two, not as crudely pragmatic as the first and, hopefully, a little less metaphysical than the second.

The title of my article might suggest some ritualistic similarities between science and Christianity, and, though this is not my primary intent, it might be interesting to look at a few possibilities.

As a research scientist I have had my share of research grants. I have also noted that unless one is rather adept at writing safe and sure research grant applications, the renewal proposal, three years later, will certainly contain some elements of confession and penitence, the extent of the latter largely dependent upon the skill of the reviewer in rationalizing the deficiencies in his progress report. Then, too, most of us regard our students with a strong sense of paternalism, a bit the way the Apostle Paul regarded his young fellow-worker Timothy, and we look fondly at the prospect that they may someday be our disciples. Finally, when one looks at the publication of scientific papers, the importance of being right, of judging rightly, is very much in evidence, and one stands before his referees almost as though this was the Final Judgment Day. Of course there are some interesting variations. One humorous example comes out of the life of the grand old man of genetics, Britisher J. B. S. Haldane. It seems that he was once asked by a group of students to decide what he would choose if he were allowed one more gene than he now possessed. His immediate answer was "cellulase," whereupon the students, in reflecting on his choice, praised his wisdom for choosing the gene which would allow him to digest cellulose since, as the future brings even greater scarcity of food, that would be the most plentiful possible source for carbohydrates. Haldane's response was that his choice of the gene for cellulase had nothing to do with the food supply. Instead, it would enable him, as an editor of a scientific journal, to eat each page of manuscript after reading it and then write back to the author, "I have thoroughly digested your manuscript!" And, of course,

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our judgement is always tainted. "Who," as Walter Hearn has asked, "is not tempted to denounce the speck in his brother's manuscript in spite of, or because of, the log in his own" (1).

Beyond these tempting comparisons, there lies a more serious area of correspondence between science and religion. Paul Tillich once referred to this age (our culture) as "the land of broken symbols." That break is at least partly science derived, based upon the assumption that objective scientific study would produce a complete description of all of reality and preclude any other source of truth as outmoded and irrelevant. So, the little boy would say. "Science is material and religion is immaterial." And so, scientists and theologians have gone their separate ways.

It was a sad parting, I feel, because each discipline had done so much for the other. It is no mistake that science came out of a Christian culture, for example. For the biblical perspective of an utterly trustworthy Creator whose universe was ordered and rational was essential to the scientists' expectation of meaningful experimentation. As Einstein later wrote, "God who creates and is nature, is very difficult to understand, but He is not arbitrary or malicious." Then, too, to be a scientist was an honorable and worthy occupation, in contrast to the pagan idea of science: Prometheus stealing fire from the gods, who were jealous of moral man's possession of their knowledge. Biblically, man is presented as a creature of God and his work, as part of the Divine unfolding, to have dominion over the earth, always with the proviso to love God and neighbor. So the scientist is no unwelcome interloper but a servant-son in his Father's creation. As Oxford's Charles Coulson once said, the practice of science is to be seen as a fit activity for a Sabbath afternoon (2).

Science, in return, has given the theologian a real world. As Walter Thorson (3) has expressed it, "medieval society and medieval thought were . . . centered on a fundamentally religious conceptual framework with a papier-mâché sort of physical universe which had no more meaning than a kind of 'stage prop' on which the drama of salvation was enacted." By comparison, science "took the secular world and the secular calling more seriously. Instead of a papier-mâché universe, God had made a real one, and the basic inspiration for the scientific revolution was a passionate belief that, in exploring and knowing what God had given us men in creation, we would find a larger framework in which our grasp of our role and destiny—could grow and develop further."

The challenge came in the words of Francis Bacon, "if . . . there be any humility towards the Creator, if there be any reverence for or disposition to magnify His works, if there be any charity for man . . . we should approach with humility and veneration to unroll the volume of Creation" (4). Science thus came as an outgrowth of religious concern, not as a competitor but rather as a complementary activity, to enlarge our view of God's Creation.

This idea of complementary views of Reality has been dealt with rather well in an analogy once presented by the aforementioned physicist Charles Coulson. During World War II he had the responsibility at the University of London for the building of a new physics laboratory. Because of space limitations and because of the bombing it was decided to build the laboratory beneath the quadrangle. On occasion, Coulson met with the architects and reviewed the plans for this unseen building. He noticed that there was a variety of drawings and blueprints; floor plans, sections, elevations, some detailed, some rough. None was complete, none exhaustive, though each was complete in itself.

It occurred to Prof. Coulson that this was a rather apt analogy to the nature of
Truth. The various drawings were like the different disciplines: science, history, the Scriptures, music, art...and as a good Englishman he also added poetry. Thus, there were many descriptions of Reality, the unseen building, but none was complete or exhaustive or exclusive.

As an example we might consider a rose.
The Poet says “A rose is a rose is a rose.”
The theologian might say “A rose is God’s herald of summer.”

And the scientist might say “A rose is that part of the rose plant that bears the reproductive apparatus: the stamens, the pistil, the petals, and so forth.

Each is a valid description of a rose, but each says something quite different.

With this view of Reality, gone is the idea of exclusiveness of knowledge in any one discipline. All have some part of describing the unseen building which is Reality.

Especially in our day, when science is deified in the form of scientism and man’s rationality posed as his only salvation, as in Jacob Bronowski’s “The Ascent of Man,” we desperately need to avoid exclusivist views of truth. I have no desire to take vows in that denomination of science! One of the most common bases for the exclusivist view in science is related to the idea of objectivity. It is indeed true that objective evaluation is an essential ingredient in science, and our data will owe much of their validity to the extent to which we can avoid our own biases as we gather them. But, as physicist Michael Polanyi has pointed out in his book “Personal Knowledge” (5), there are unavoidable nonobjective components in science which determine much of our truth-seeking. He points out that there are, in fact, tacit presuppositions which we bring to our evaluation of the data; qualities like simplicity, beauty, satisfaction, hope, which have no basis in science but still find their way into our choice of hypothesis. To quote Walter Thorson (6), a leading interpreter of Polanyi,

It is standard logical positivist dogma to assert that scientific theories are merely logical orderings of empirical facts in the most economical fashion. Polanyi shows that many major theoretical achievements have been made as the outcome of a heuristic search for rational beauty, satisfying the intellectual passions of the searcher; this recognition of beauty is accepted and accredited by the searcher and by his trained peers as a guide to the structure of reality, which is as important as the process of empirical validation to the achievements of science. According to logical positivism we can have no basis for choosing between two theories if both give an economical description of the same empirical facts. Professor Polanyi asserts that such an attitude is incorrect; in reality, a scientist assesses a theory not only for its empirical validity but also for its rational appeal to him personally and for its capacity to evoke a larger conception of reality as a whole, of which the previously known is but a part. This is not to ignore the necessity of empirical observation by any means, but to show the absurdity of the positivist claim that the appreciation of rational excellence plays no essential role in scientific discovery.

I find this view of the search for truth very akin to my religious faith. For me, indeed, science is a religious experience, an opportunity to admire the artist’s handiwork. To begin to sense the enormity of a universe of stars which numbers in the billion billions or to contemplate the exquisite design of the cell’s genetic machinery is for me a worship experience. As Elizabeth Browning once wrote (7), “Earth’s crammed with Heaven. Every common bush is afire with God. But only he who sees takes off his shoes.”

But to be a scientist in this age of technological ascendency, one is also quickly reminded that our science can be a two-edged sword, that its power may be used not only to understand ourselves, to improve our lives, to heal the sick, but it may also be misused to build better weapons, to foul our water and our air, and perhaps even to make us into automatons incapable of the love of God and fellow man.
Kenneth Boulding, an economics professor at Michigan, some years ago wrote somewhat facetiously about a rather apostate "church" called DuPont (8).

The Main Objective of DuPont
Is making things which people want,
Perhaps not giving too much thought to
Whether folks want just what they ought to!
In modern industry, research
Has come to be a kind of Church
Where rubber-aproned acolytes
Perform their Scientific Rites,
And firms spend funds they do not hafter,
In hopes of benefits Hereafter.
And yet, by the greater part
Of Chemistry is still an Art;
In spite of scientific fuss
Research is just a blunderbuss,
Which shoots a monstrous charge of shot,
And sometimes hits, but mostly not.

Professor Boulding then rhymes on to emphasize the needs of social science, in view of this present misdirection of priorities. But, although the charge of manipulation and misuse of science may not be totally fair here, it comes closer to the truth than we often are willing to admit. Indeed, in many areas of our science we stand on the brink of selling our birthright for a mess of pottage. This comes forcefully to my view when considering the medical sciences. Rapid technical advances in genetic manipulation and screening, behavior modification, and psychosurgery forecast enormous ethical problems in the near future. Yet very few scientists are concerned. Gerald Holton, at a recent symposium on the ethics of genetic research (9), states that fewer than 1% of scientists indicate any interest in ethics. Could it be that, in our effort to be as objective and impersonal as possible with our data, we have forgotten that we are human and therefore responsible beings? If true, then we are not only in need of reminding, but perhaps even of revival! Perhaps the words of the Apostle Paul to his fellow-worker Timothy to "stir up the gift that is within thee" is rather appropriate here, for surely our culture with its worship of objectivity and its avarice for all that technology can give has reduced man to machine status and created a deep-seated tension, a kind of schizophrenia in all of us. As Norman Mailer says in "Of a Fire on the Moon," "there exists at once in us a desire for the most 'objective' scientific facts alongside a yearning to preserve the individual, subjective, and non-scientific view of man and his universe."

To my way of thinking, the Bible gives to us the most profound yet lucid description of what all this means. Men, created in God's image, was made for fellowship with Him as the servant-son to rule the earth in responsible freedom. But the Scripture records that man chose to revoke his sonship and to seek to be the master of his own fate. The choice was a disastrous one, for man in his finiteness now found himself alone to cope with the incredibly complicated world. He was, as Pascall puts it, "at best a thinking reed." And to compound the difficulties, in his rebellion and self-will he lost that freedom to serve his God and his fellow man, and instead became a slave to self.

The solution was God's to provide. Scripture records that, "when the fullness of time had come, God sent His Son." The God-man, Jesus Christ, crashed into history; God Himself had entered into the dilemma of human history!

The purpose of this visitation was none other than man's redemption, his rebirth into the family of God to a life everlasting, through a response in faith to Jesus. As
Jesus Himself told his disciples (10) "and this is life eternal. That they may know Thee, the only True God, and Jesus Christ whom thou has sent." The life Jesus lived, the miracles he performed, the words that he preached, the way he died ... transcend anything the world had seen or will ever see again. He showed us, I think, what God had intended man to be! And even more, he showed us the heart of God, longing for us to surrender to his love, eager to have us once more as servant-sons in his creation, living joyously in responsible freedom.

To try to sum up what I have said, I would like to leave you with a modern parable about a fish which could live out of water (11).

It seems that some scientists at Smolensk University decided to develop a fish that could live out of water. So, choosing some healthy red herrings, they bred, crossbred, hormoned, and chromosomed until at length they had a fish that could live—at least exist—out of water.

The local commissar was not satisfied. True, these fish had survived till now on rarefied gas, but how about reactionary tendencies? He suspected a secret yen for water. "You have neglected education," he said "Start over, and this time don't neglect education."

So again, they bred, crossbred, hormoned, and chromosomed, and this time they didn't neglect education, down to the veriest reflex. The result? A red herring that would rather die than get its tail wet. The slightest suggestion of humidity filled the new herring with dread. Thought control had done its perfect work, and everyone was happy. Surely this year's Lenin Prize would go to the scientists of Smolensk University.

But the world must see this triumph of research. The commissar who had thought of education must take the fish on tour. Somewhere in Hungary the tragedy occurred. Quite accidentally, according to official reports, the red herring fell into a pool of water. Deep in the gray translucent stuff it lay, eyes and gills clamped shut, afraid to move lest it become wetter. And of course it couldn't breathe; every reflex said No to that. Never did a fish so wet feel more like a fish out of water. But breathe it must, and there was nothing else to breathe. Only water. So the red herring drew a tentative gillful. Its eyes bulged. It breathed again. Its jaw flew open. It flicked a fin ... then another ... and wiggled with delight. Then it darted away. The fish had discovered water.

And with that same kind of wonder, men, conditioned by a world that rejects Him, discover God. "For in him we live and move and have our being."

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