



Science/Technology Education in Church-Related Colleges and Universities

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Session 5: Small Group Reports

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Session 5: Small Group Reports

BARNES (GROUP 1): Our topic concerned modes of scientific and theological knowing. We came up with four aspects which we thought were major elements. First, we considered science and religion as ways of knowing. The discussion quickly revealed that science is in fact several ways of knowing, disputed even among those who do science and the philosophy of science. This is true also of theology or religion. Each side should be introduced by the other to the complexity of these ways of knowing, if we are to understand why things get so confusing. That discussion developed into subtopics concerning the nature of truth, the nature of knowledge, and eventually into objectivity and subjectivity. A second major factor then arose: the question of the place of values in theology and in science.

Most of the discussion centered on ways in which values can affect science. Here, the major issue was gender, the way in which gender orientation influences the language and making the models in science come out in a certain way. Models of dominance are used more often than models of cooperation. That's true in theology also, as you're aware. That is big enough to be another topic of how religion (or theology) and science act differently with relationship to each other.

The third topic was the models of reality that science and theology can use. For example in the sciences, physics, chemistry, and so forth have a variety of models. Also, models may change. In geology, plate tectonics is now the dominant model, but was not always such. Each of the sciences may have more than one, even conflicting, models. Theology is the same. Theology also shows different models of reality. Take the difference between eastern theology and western theology. A process theologian in the West doesn't see reality the same way as a good Thomist would see it.

A fourth and lesser point, but I suspect very important, was language. When we talk to each other across the divisions between theology and science, we'd better constantly make clear to each other how we're using words like paradigm, model and so forth. Otherwise, we'll never get very far.

PROCACCINI (GROUP 2): We discussed the interface between science and religion. I offered from my own experience a course that I had designed and continue to teach relating 20th century science to 20th century art. I have a joint appointment in biology and art history, particularly the modern period. When I began to research the course, I expected to find parallels. I did not expect to find so much convergence or so much symbiosis between them.

New research has shown that Picasso and Brach in 1907 were familiar with Einstein's 1905 paper on relativity. They made a conscious attempt in cubism to equalize the spatial-time relationships he talked about. Also, between around 1900 and 1930 there was a style of sculpture called biomorphic sculpture because of its profound allusion to the development of organic forms, particularly in multicellular organisms. The artists who espoused this style are major figures like Brancusi, Henry Moore and Barbara Hepworth. Their sculpture parallels some intense research in developmental biology in Europe then. These artists looked at the journals and studied the pictures. I never assumed that they understood all the scientific terminology, but they were moved by the process they saw unfolding in the pictures. That gave them the inspiration for their art. Very recently, the new science of chaos has engendered a whole variety of performance arts in New York City which attempt to do exactly the same kinds of things.

I found several dozen such parallels and convergences and symbiotic relationships. What startled me were the autobiographical writings of some of the scientists and artists whom I decided to study. Some of the scientists were Pasteur, Darwin, Marie Curie and Stephen Hawking; some of the artists were people like Paul Cezanne and Barbara Hepworth. I found all of them talked about being conduits through which the answers to some essential question somehow flowed. None of them took responsibility or credit for what they had done. They said that somehow something passed through them which gave them an insight into organic forms, the beginning of time or biomorphic sculpture.

The role of intuition in all of those creative acts was pronounced. I wasn't surprised to see that in the artists, but I was quite surprised to see it so dominant in the scientists also. Einstein, near the end of his life, wrote that scientists would be the priests of the 20th century. Stephen Hawking gave an interview several years ago to the *New York Times*. The interviewer expected that Hawking would talk about all the mathematical formulations he thinks through as he's working his way to this new grand theory. Instead, Hawking said to him, "I don't do that at all. I simply make an intuitive leap into the dark and if it seems right, if I get a feeling of rightness, I back up and try to develop the mathematical formulation to present it in a logical way." The interviewer said, "That sounds remarkably like what an artist does, the leap of intuition that enters into painting and sculpture." Hawking said, "That's exactly right. That's how I think about myself."

I showed the writings of some of the scientists and artists to some friends. I took out all the proper names and asked them to tell me who the scientists were and who the artists. They were not able to uncover the difference between the two. They saw the essential similarity.

Group 2 used this as a springboard. We decided we didn't like the word interface because it still talked about boundaries. We used the integration of one discipline and another. We also discussed intuition as a central way to bring together interrelationships between art and science or religion and science, and that the intuition occurs in a person. We briefly discussed the logic of discovery as a binding agent, particularly because of the element of uncertainty there.

SEIBERT (GROUP 3): We spent part of the time asking if there was something unique about church-related colleges. Each time we mentioned something somebody would say that that's done in state universities. We went through any number of things, engaging science and theology departments in that order. The University of Florida does this, and so on down the line. We persisted and finally came up with the conclusion that maybe we had better change the word to "characteristic" rather than "unique." The things we had discussed prior to that -- the atmosphere that permeates the institution, atmosphere translated into individual actions, having a mission statement -- all of those things would involve characteristics that should be part of a church-related institution. The institution itself should have the link to religion or faith. How should it be expressed? It's used in the institution particularly in science classes to touch on the future of the human race. The Lord and science should be discussed. One person suggested that in every church-related institution, there should be a discussion of Vatican documents and a report given to the bishop on the results of those discussions. Provide a forum for such discussions rather than just a classroom area. Communicate the results. There should be value focus in courses in the curriculum, and courses that have a value basis should be required in the core. That also applies to some non-church-related institutions.

We discussed the concept of hiring people in the institution. What kind of policies should we have and what kind of questions should we ask individuals? Many institutions have individuals teaching for them who are not of the same faith persuasion -- Catholic or Protestant or whatever. Some institutions have policies and some do not. We ended up saying that we need to strive for the ideal world. We should try to hire those who would uphold the same values as we see our church-related institution holding.

BERTRAM: It's not for me to add to your group's report, but had it occurred to you that what might be distinctive about the Christian community that it keeps asking the question what is distinctive about the Christian contribution?

SEIBERT: No, we did not discuss that. But at this point I'm not even sure that would be unique. I can remember 50 years ago one of our sisters used to come in and ask what it was that makes an Ursuline college. How are we different? We still haven't answered that.

CROSS: Four things emerged in our group about the characteristics of science education at church-related institutions: 1) they're person centered, which might make them different; 2) there's an extra freedom; 3) there is or ought to be an emphasis on science fields as service fields; 4) there's a need to counteract the negative view of science.

On the first theme, the person-centered nature of church-related institutions should make it easier to teach the difficult sciences, should encourage more tutorial instruction, should create an atmosphere in which minorities are helped to overcome any disadvantages they may have with respect to science education. This person-centered nature of educational ideals in our institutions ought also to extend to non-science majors.

The issue of freedom in education, of course, in this country means that we're free to express our religious views and the views of our churches within our institutions which is, at least, more difficult to do within the secular institutions. Dialogue is possible about the interrelationship of religious and scientific views. We're freer to relate science and religion, to examine the myths and traditions of religion from a scientific perspective, to discover that there are, as other groups have pointed out, multiple models. We noted that in all events we have limited approach to the truth both in religion and in science. We would expect in our institutions more integration between the sciences and beyond the sciences because of a more holistic view of human experience.

Then there's the third topic, namely, science fields as service fields, with a caveat: not everything that can be done should be done. We can instill a kind of risk/benefit perspective in our students with respect to the pursuit of scientific knowledge of certain kinds and its application. We can make our students sensitive to the problems of resource allocations within society. We also have a need to point up our own personal biases, to show a respect for plurality in our sciences and educate for responsible citizenship, which includes knowledge of scientific advances and possibility. We can avoid scientism (the making of science into a religion) which is a problem in some secular institutions, and recognize the contribution of science to religion and religion to science. We can emphasize the role of stewardship as a Christian ideal.

Fourth, we should work to counteract the negative view of science, pointing out to our students the vast potential for good along with the limitations of science and the possibility of misuse of science.

SHEAHEN (GROUP 5): Our topic was the faith development of scientists. We tried to find commonalities both from our own experiences and from what we think we know about scientists in general. The motivation to develop faith begins with the setting aside of old images in the search for new ones. Very often it is the case that professionals in the sciences do not keep their religious development up to the standards which they have for their professional fields. This is a serious problem which should be worked on in the church-related setting. For example, it's important that adults who are professionals in the sciences also be at an adult level in faith. I didn't hear the word clockmaker mentioned, one of the old images of God which is dismissed by scientists. The god of intimacy is more the god that scientists find. Since their science is an incomplete body of knowledge, awe and wonder are big components of the faith development of scientists.

There was widespread agreement that we need to communicate this image, the values, and so on to our young people in the educational process. It is helpful for scientists with faith to communicate with one another in small communities, in order to articulate the ways in which they engage in apostolic activity. Health care is a good example of engaging in an apostolic activity in the framework of science. This kind of reinforcement in a life of faith can be a valuable asset.

KEILHOLZ: That last point sounds like a commercial message for ITEST as a community of scientists and theologians.

VOICE: One of the other mystical aspects talked about is the experience of limit. That brings a humbling experience, realizing there is an ultimate dependence on God.

BERTRAM: May I presume to speak for all of you when I thank all of you for investing yourselves so imaginatively and resourcefully into the evening's proceedings. I want to thank those who worked as volunteers to identify these isolated questions. It's clear now that we've got more than enough to talk about tomorrow in the sessions that remain. When we do talk about them, we'll talk about them with greater focus.

Science/Technology Education in Church-Related Colleges and Universities		
ID	Article Title	Author
BK022-001	Table of Contents	
BK022-002	Foreword	Father Robert Brungs, SJ
BK022-003	Keynote Address	J. A. Panuska, SJ
BK022-004	Reflection: Imaginative Learning in Theology, Science and Technology	J. Cross, C. Ford, G. Magill
BK022-005	A Pilot Study of the Present Condition of Undergraduate Science and Technology Education in Church-Related Colleges as Perceived by Department Chairpersons	Charles E. Ford
BK022-006	Feasibility of Developing Adequate Natural Science Programs in a Church-Related School	J. Richard Chase
BK022-007	Why Church-Related Institutions Should Be Involved in Science/Technology Education	Sr. Rosemary Connell, CSJ
BK022-008	Science and Technology in Jesuit Education	Robert A. Brungs, SJ
BK022-009	Science/Technology Education: An Administrative Perspective	James Bundschuh
BK022-010	The Ideal and Reality of Science Education in Catholic Colleges and Universities	Thaddeus J. Burch, SJ
BK022-011	In What Ways Can Science/Technology Education Enrich the More General Liberal Arts Emphasis of Many Church-Related Schools?	Sr. Mary Virginia Orna, OSU and Sr. Angelice Seibert, OSU
BK022-012	The Role and Importance of Research and Publication in Church-Related Schools	James W. Skehan, SJ
BK022-013	Developments in Science/Technology/Society Curricula at the Secondary Level and How Colleges Can Connect and Continue	Marie Sherman
BK022-014	STS: A New Opportunity for the Re-Integration of Christian Concern into American Academic Life	Rustum Roy
BK022-015	Session 1: Discussion after Keynote	
BK022-016	Session 2: General Discussion	
BK022-017	Session 3: General Discussion	
BK022-018	Session 4: General Discussion	
BK022-019	Session 5: Small Group Reports	
BK022-020	Session 6: General Discussion	
BK022-021	Session 7: General Discussion	