

Exploring Relationships: Scientists and Theologians

ALL ON THE SAME SIDE: REFLECTIONS ON THE
DIALOGUE BETWEEN SCIENCE AND RELIGION

by *David M. Byers*

Abstract. The “war” between religion and science is winding down, creating new opportunities for fruitful dialogue. The foundations of indirect religion-science dialogue, where the perspectives of the two disciplines illuminate some third subject, are not well established. A detailed comparison of the Roman Catholic bishops’ dialogues and a similar program within the American Association for the Advancement of Science illustrates the variety in formal science-religion interactions and reveals much about the promise, achievements, and limitations of different approaches. Success depends in large part on controlling the diversity of the dialogue group, choosing topics carefully, and adopting positive and cooperative attitudes.

Keywords: American Association for the Advancement of Science; direct religion-science dialogue; diversity in dialogue; indirect science-religion dialogue; National Conference of Catholic Bishops; practical limitations of dialogue; religion-science-industry model; search for wisdom; shared goals of dialogue; spirit of dialogue; topics for dialogue; war between religion and science.

A couple of years ago, the *Washington Post Magazine* ran “A Beautiful Illusion,” a well-crafted, informative, entertaining article on, among other things, the possibility of extraterrestrial life. It is a piece about science that is not hostile to religion, implying that those who pray may be as tuned to

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unraveling the mystery of the universe as those who experiment. Yet, almost inevitably, embedded in the text like a lump in gravy, is the following: "Galileo got in trouble for inventing a new tool that changed how we view reality" (Achenbach 1997, 15). Poor Galileo! The man who helped found modern science by combining observation with mathematics is remembered most often for getting into trouble with the Catholic Church. Capricious history has transformed Galileo the scientist into Galileo the symbolic victim, the first casualty in the war between religion and science.

No war lasts forever. This one, which is part fact and part myth, shows clear signs of winding down. Most of the great early scientists, including Galileo, were serious believers who saw little if any conflict between science and religion. However, for reasons too complex to explore here, the two disciplines have counterdeveloped over the centuries, like twins trying to establish their separate identities. Again like twins, they remain related in blood and bone and cannot ignore each other, a fact progressively recognized on both sides. Einstein did not believe in a personal God, identifying the religious sense with a recognition of "super-personal objects and goals." Nevertheless, his 1941 remark, "Science without religion is lame, religion without science is blind" (Einstein 1956, 26), is much quoted. Pope John Paul II had a very different religious world in mind when he said in 1988, "Science can purify religion from error and superstition; religion can purify science from idolatry and false absolutes. Each can draw the other into a wider world, a world in which both can flourish" (John Paul II 1988, M13). Still, pope and scientist are expressing the same reality: their two disciplines are somehow parts of a greater whole.

This realization is rapidly becoming more general. While ignorance and bias persist, observers on both sides realize that reconciliation between science and religion is desirable, and not only because people of goodwill should let go of old grudges. The two disciplines have much to offer each other. Together they have much to offer our fragmented, insecure culture, in which to many religion seems old-fashioned and science threatening. Dialogue between religion and science is an increasingly important part of that civilized conversation, that personal and social healing, which is in healthy demand today.

The urge to communicate has a substantial lineage on the religious side of the aisle. A number of organizations have appeared within U.S. Christianity in the past few decades, each approaching the problem from its own perspective. The American Scientific Affiliation (evangelical Protestant) was founded in 1941, the Institute for Religion in an Age of Science (liberal Protestant) in 1954, and the Institute for Theological Encounter with Science and Technology (mostly Roman Catholic) in 1968. These pioneering organizations have inspired the creation of many other groups and agencies on the denominational, ecumenical, and interreligious levels, all striving to give the relationship between religion and science institutional expression. For example, the National Conference of Catholic Bish-

ops (NCCB) launched a Committee on Human Values in the mid-1970s, which initially failed. Resurrected as the Committee on Science and Human Values in 1984, it exists to bring Catholic theology and moral thought into fruitful contact with advances in modern science and technology. The response from the science side is more recent. The American Association for the Advancement of Science's (AAAS) Program of Dialogue of Science, Ethics and Religion (DoSER), founded in 1995, may be unique within the scientific community.

As hands across an old divide, agencies such as these are gradually building a new field of discourse—or, more accurately, *fields* of discourse. The term *science-religion dialogue* covers at least three different forms of engagement between the disciplines, distinguishable by their purpose. The many cases James Gilbert discusses in his *Redeeming Culture: American Religion in an Age of Science* (1997) suggest that most dialogue earlier in the century attempted to reconcile religion and science, treating them as alternative descriptions of reality or ways of knowing reality. This is essentially an intellectual enterprise. For example, theologians may strive to construct a systematic account of God's creation that fully recognizes the evolutionary character of the universe. In a narrower frame, they may juxtapose foundational Christian doctrines like the Fall and Redemption with a scientific account of human evolution, or Christianity's affirmation of God's love with the reality of natural selection.

The second sort of dialogue examines this same relationship from a pastoral or psychological perspective. The tortured arguments of creation science are only one manifestation of the dilemma science can pose for us distracted moderns. How can I reconcile my attachment to a set of traditional beliefs with the constantly changing, apparently soulless universe the physicist and biologist may paint? Dialogue between people of faith and scientists (who may also be people of faith) can strengthen the individual against the corrosive conviction that the advance of science means God's disappearance or, at best, the fading of God into benign vagueness.

Both of these kinds of dialogue may be called *direct*, because their focus is the relationship between religion and science themselves. Also they often happen together, as aspects of the same discussion, which may be intellectual in content but motivated by personal discomfort. The third sort of dialogue, by contrast, does not attempt to reconcile the two disciplines. It assumes their worth and uses them as tools to probe a third subject, which can be anything from the existence of natural laws to human cloning. A series of discussions that the NCCB Committee on Science and Human Values has been conducting and DoSER's 1996–97 exploration of the patenting of genetic material are examples of such *indirect*, outward-looking dialogue, which the growing power of science is drawing into greater prominence. A closer examination of these programs will allow us to probe the nature, limitations, and considerable promise of such indirect dialogue. First, the bishops.

THE ROMAN CATHOLIC BISHOPS' DIALOGUES
ON RELIGION AND SCIENCE

The Roman Catholic bishops of the United States sponsored their first religion-science dialogue in 1986. The Committee on Science and Human Values hosted a conference near Detroit that brought together philosophers, theologians, and scientists to wrestle with such topics as "Religion, Science, and the Search for Wisdom" (committee chairman Cardinal James Hickey, Archbishop of Washington), "Religion and Evolutionary Theory" (Edward Wilson, Harvard University), and "The Science-Values Relation: Impact of the Consciousness Revolution" (the late Roger Sperry, California Institute of Technology). Like most academic conferences, the session produced nothing concrete beyond a book of proceedings, now out of print. However, it served to open a door long closed.

Since then, the bishops' committee has sponsored dialogues with groups of U.S. scientists, sporadically at first, routinely in recent years. These are weekend events, two-day discussions that begin at noon Friday and end at noon Sunday. The participants on the religious side include the seven bishop members, two or three other bishops invited for their special expertise, and a moral theologian. A consultant recruits the scientist participants, so the committee is not dealing with people who already share its philosophy and theology. Very few have been Catholics. However, all have interest in matters religious, whether they practice their faith or not, and all are open to discussion leading to the discovery of common ground. As with the bishops, some of the scientists form a core group that carries over from one annual session to another, whereas others are invited as experts on the topic of a particular meeting.

In the 1990s, these dialogue sessions covered global population, genetic testing, genetic screening, end-of-life issues (definition of death, assisted suicide, terminal care, pain management, and so on), cloning, and stem cell research. The discussions have yielded reports to the bishops at large and four popular-level publications aimed at educating people on advances in science and technology as viewed through the lens of Catholic thought: *Science and the Catholic Church*; *Critical Decisions: Genetic Testing and Its Implications*; *The Promise and Peril of Genetic Screening*; and *The Manner of Our Dying*. These statements amount to a unilateral withdrawal from the war between religion and science. The first, *Science and the Catholic Church*, echoes John Paul II's 1988 declaration, saying: "The historical tension between religion and science is unnecessary and harmful. It should end, for our two communities' mutual benefit."

What sustains this experiment? The most important factor is commitment to a shared goal. Dialogue is impossible without two sides, and yet in some sense all the participants must be on the same side. The richness of the discussion derives not from the clash of opposites but the contribu-

tion of variant views. To cite a particularly apt comment of St. Paul's: "I plead with you . . . to lead a life worthy of the calling you have received with perfect humility, meekness and patience, bearing with one another lovingly. Make every effort to preserve the unity which has the Spirit as its origin and peace as its binding force" (Ephesians 4:1-3 NAB). Science-religion dialogue is a search for peace and, in the broadest sense, for unity.

The participants may articulate their shared goal in different ways. For the bishops, it is enlisting the aid of scientists in understanding vexing pastoral problems. Genetic testing of fetuses can lead parents to consider abortion; genetic screening creates the possibility of systematic discrimination in hiring, health insurance coverage, or eligibility for other social services; cloning may allow us to bring another human being to birth for our own selfish purposes. It would be enormously helpful for Catholic pastors to understand the reliability of tests for such conditions as neural tube defect, sickle-cell anemia, Alzheimer's disease, or depression; to know what implications carrier status has for those planning marriage and a family; to be able to discuss relative risk accurately; and to help people assess their options. It is important for the Catholic health care system to train genetic counselors who are steeped in both the relevant science and Catholic moral teaching. In taking public positions, bishops must be aware of both the attractions of cloning for research and the threats it poses to human dignity. Connection to the scientific community helps the church apply principle with a healthy realism, neither approving behavior naively nor condemning it without cause.

For their part, scientists may seek reassurance in dialogue that the knowledge they advance is not unintentionally harmful. Genetic screening, as it becomes more reliable and precise, will allow medical science to identify, treat, and perhaps even eradicate diseases like cystic fibrosis or breast cancer. But what about screening for mutations for which there is no treatment? or for mutations that do not necessarily cause disease but indicate a percentage risk that the individual will become sick? How can one be sure genetic information remains private and confidential and is not posted in databases accessible to commercial interests or the government? Since the development of nuclear weapons in the 1940s it has been painfully evident to scientists of conscience that knowledge is power for good or for ill. Genetics and the emerging biotechnologies are increasing this power at breakneck speed. For scientists, dialogue offers the opportunity to view their discipline in the broader context of morality, whether it be the Catholic tradition or simply the prevailing standards of the culture. It allows them to question how scientific knowledge is used or, mindful of the Tuskegee experiments and similar horrors, to ask whether every scientific curiosity should be pursued.

Thus, the common goal the Committee on Science and Human Values shares with its partners is greater realism. At times in the past, both religion

and science have asserted an exclusionary claim to the truth, each treating the other as a competing belief system. In fact, each is a lamp to explore the vast mystery that surrounds us and in which our being is grounded. The two disciplines are not pertinent to every inquiry; for example, science lacks the tools to probe questions of meaning, religion the tools to explore physical structures. Where both are pertinent, however, the light of both their lamps illuminates an issue more clearly than the light from either one alone.

The greatest problem the bishops encountered in the early dialogue sessions was a sort of psychological inertia; 350 years of mutual distrust constitute a formidable obstacle. Nevertheless, hurdling this barrier proved surprisingly easy. The first session in the current series of dialogues dealt with global population, a tricky subject from the Catholic perspective. Discussion was making little headway when one of the bishops suddenly directed a general question to the scientists. "Tell me," he said, "what is your image of a bishop? Whom do you think you are dealing with here?" One by one, the scientists around the table responded: a bishop is a stern, remote figure who speaks authoritatively out of settled tradition. A scientist participant then asked the obvious follow-up question: "What is your image of a scientist?" As it turned out, the images were almost identical; each group saw the other as representing a rather forbidding voice of authority. Once these stereotypes were swept away—the bishops quite literally switched from Roman collars to shirt sleeves—the conversation went dramatically better. Ever since, new members on both sides have readily accepted the spirit of the dialogue, which is natural, straightforward, and informal.

The exchange about stereotypes enabled the participants to recognize their partners in dialogue as partners. It also allowed them to play their roles in the discussion earnestly and cordially. The 1998 session on cloning may serve as an example. The scientist participants took responsibility, as they always do, for ensuring that everyone agreed on the facts. The weekend began with two presentations from the science side, one on cloning in general and the other on human cloning. Then followed a period in which the scientists added to or disputed parts of the presentations and the bishops asked questions for clarification.

Once the scientific consensus on cloning was established, the bishops accepted it as the basis for discussion; it was not their role to challenge data. Rather, they took responsibility for reviewing this information in the light of Catholic moral thought, initially through a facing presentation. The purpose of this talk was not to lay out precise Catholic teaching on cloning, because it is not yet fully articulated. Rather, the speaker explained the relevant circumstances and principles: for example, the church's opposition to separating reproduction from sex and to destroying embryos, and its commitment to defending the rights of human clones, should any

ever be born. Again, a period for comments and questions followed. Once the Catholic perspective was clear to all, the scientists accepted it as the framework in which the group would explore the topic.

After that the conversation flowed freely. In a formal dialogue, bishops and scientists would have remained locked in their separate domains, the one talking about morality, the other about facts. In reality, the scientists readily expressed moral and philosophical views, and bishops sometimes discussed the science. Not only did the participants cross over, they indulged in tangents from which the moderator had to pull them back, and generally engaged in a lively, intelligent exchange. The discussion on cloning moved with considerable verve toward a spirited identification of common ground on Sunday morning. The resulting report to the bishops treats a wide range of issues, identifying areas of substantial consensus, areas of disagreement, and areas needing further attention.

Despite the informal structure of the NCCB sessions, the two sides take their roles seriously. There could have been no true dialogue on global population if the bishops had sidestepped church teaching on artificial birth control, or if the scientists had come with the object of changing the bishops' minds. Similarly, there could have been no true dialogue on genetic testing if the scientists had suppressed their belief that a positive test result sometimes justifies abortion, or if the bishops' goal had been to convince them that they were wrong. Each side comes to the table with commitments their interlocutors respectfully accept, even if they find these ideas objectionable. As noted above, however, the *sine qua non* is that all be on the same side in the search for mutual illumination.

This practical toleration extends not only to opinions on particular issues like abortion but also to background *weltanschauung* such as Thomist philosophy or faith in the scientific method. Although such context rarely becomes the direct subject of discussion, it colors what people say. If either side were unwilling to concede it *as valid for the other side*, the dialogue would break down. As I once put it, "Science and religion are like two people hesitatingly approaching common ground, a sort of *agora* of the spirit and intellect. They approach this ground from different directions and set most of their baggage down before entering. Then they talk, reaching back now and then to pull out a glittering idea or square-edged tool, offering these things to one another as gifts. After a time they walk away with a contented frown and, as if by magic, the circle of common ground expands" (Byers 1996, 15). Above all, the Committee on Science and Human Values has learned that dialogue is an exercise in gift giving.

The Catholic bishops' dialogue has been a clear but quite limited success. It is a denominational activity rather than a come-what-may conversation open to any outcome. While the bishops who take part are not all of one mind on the subject at hand, their views vary within a framework, that of the Catholic moral tradition. Moreover, the scientists, who may hold

significantly different views, understand that any publications the committee issues in the wake of a dialogue session will take stances consistent with that tradition. For example, *Critical Decisions: Genetic Testing and Its Implications* strongly opposes terminating pregnancies, even though the group reached no consensus on this matter. In other words, the dialogue is bounded. The statements it produces on pressing moral issues have the great advantage of getting the facts straight. These statements by and large do reflect true consensus; abortion and the destruction of human embryos are the only major issues on which the participants have agreed to disagree. However, they are publications of the Committee on Science and Human Values, an agency of the Catholic establishment. Where doctrine is concerned, they do not venture beyond the pale.

AAAS PROGRAM'S DIALOGUE ON GENE PATENTING

DoSER's gene patenting project resembled the Catholic bishops' dialogues in many ways. Their goals were quite similar: to create greater understanding among the participants; to find common ground; and, if possible, to take a public stance of some sort. Most of the partners in dialogue were drawn from the same worlds. The sessions proceeded in much the same way, with presentations followed by open discussion. Finally, the atmosphere was for all practical purposes identical, marked by informality, good humor, and steady goodwill.

However, the contrasts are perhaps more instructive. Whereas the NCCB group chooses its own topics at the end of each session from a list prepared by staff, the gene patenting discussion was triggered by an outside event, the publication of a brief, strongly worded statement by a coalition of religious leaders in May 1995 opposing the patenting of life forms. The statement provoked powerful opposition from scientists and from the biotechnological and pharmaceutical industries and caused consternation within the religious community itself. The former were disturbed because the statement was so broadly worded as to exclude the patenting of genes and cell lines, one of the fundamental tools of current biological and biomedical research. Moreover, it had the backing of a lobbyist well known for fierce assaults on the legitimacy of such research. Some religious leaders objected because they recognized the potential of genetic engineering to treat disease and develop new drugs and saw patenting as a legitimate means to these ends. Others, including the Catholic bishops' committee, believed the statement was inadequate because it made no distinction between human and animal life.

The DoSER undertaking was enormously more complex than the bishops' effort. First, though properly called a dialogue, the discussion involved representatives of three constituencies: religion (almost entirely Judaeo-Christian), science, and the biotechnology and pharmaceutical industries. Other voices also were involved in the discussion and some-

times played important roles. Second, the religious participants were divided among themselves, and scientists in and out of industry spoke from different perspectives. Third, the group discussed gene patenting in three sessions over a period of twelve months, not in a single weekend conversation. Finally, the character of the conversation varied with time and circumstance. The first session in March 1996 featured two principal and nine shorter presentations, with group discussion. There were six presentations in the second (October) session, but the central focus was an unsuccessful effort to modify and achieve consensus on two draft statements. In preparation for the final session in March 1997, fifteen members of the group responded to an invitation to put in writing their views on the patenting of genes, living organisms, and human tissues and cells. However, actual discussion revolved around two major papers, one by a participant theologian and the other by a guest ethicist. In addition, a panel composed of a member of the religious community, a scientist based in industry, and a philosopher offered options for the future.

To a much greater extent than the NCCB dialogues, the DoSER sessions were designed to be inclusive, comprehensive, and open-ended. The director of the program, Audrey Chapman, described in a March 1997 memo how she organized the project: "The intention was for the participants in the Gene Patenting Dialogue Group to represent the major communities that had an interest in the subject and, to the extent possible, relevant agencies and organizations. Members have come from a wide range of professional backgrounds: the religious community (representatives of church agencies and academic theologians), science (academics, industry and policy positions), industry (trade associations and corporations), law and secular ethics." In contrast to the NCCB dialogue, the standard was group consensus, without reference to a framework like Catholic doctrine.

The determination to be inclusive guaranteed that the group would achieve its first goal, greater understanding. The participants all departed with a much more complete knowledge of gene patenting and its implications and understood much better why some oppose it vigorously, why some support it with equal energy, and why some find it a matter of indifference. Moreover, the personal relationships formed over the course of a year should help build bridges among the religious, scientific, and industrial worlds, aiding future communication.

However, the group's diversity had three unexpected consequences. As noted above, the representatives of the religious community were seriously divided on the May 1995 coalition statement. They spent much energy debating one another on subjects ranging from God's ownership of living things to the sacredness of DNA to whether patents are anything more than a tool for advancing knowledge in a capitalist system. To a considerable extent, this side discussion dominated the proceedings. Even in the final session, one of the major papers was given by a theologian who attacked

the coalition statement. Because the religious representatives' differences were never resolved, they could not present a united front to their interlocutors.

Not only were the representatives of the religious community divided, so were the scientists. In his presentation, a leading academic scientist expressed serious doubts about patenting, citing possible negative effects on the public good. The industry scientists, on the other hand, defended patenting as an economic tool that enables corporations to invest the hundreds of millions of dollars necessary to develop a new medicine or pursue a complex research protocol. This industry view was compatible on the main question (to patent or not to patent) with the position of the religious participants who opposed the May 1995 statement. As a result, the "sides" in this meeting of science and religion quickly became muddled. Of the people who submitted written statements after the second session, six (three religious leaders, two scientists, and a secular ethicist) opposed the patenting of genes; three (one each from religion, science and industry) unconditionally supported it; and five (two scientists, two industry representatives, and one secular ethicist) accepted it under certain conditions.

This confusion of roles, when added to the group's inherent diversity, made it impossible to achieve the group's other goals, defining common ground and taking joint action. While a majority of those present could have reached agreement on certain aspects of gene patenting, they would not have represented a particular constituency. Staff did an excellent job capturing what appeared to be shared views from the first session and incorporating them into a proposed joint statement to be debated at the second. They then led the participants in a line-by-line review of the draft that had many on their feet, intensely interested and engaged. In the long run, however, there were so many different voices that consensus could not be reached even on so carefully worded a paragraph as the following: "We agree in supporting these values: that all life should be regarded with respect and human life with utmost respect, and that human suffering should be alleviated and human welfare promoted. We agree that any intellectual property protection for genetic discoveries should respect [acknowledge] these values."

As noted above, the DoSER project approximated a dialogue, with the bulk of the participants coming from the worlds of religion, science, and industry. Although some of the industry representatives were also scientists (others were public relations officers or attorneys), these three groups had separate interests and areas of expertise. The scientists were in a position to give the facts from the perspective of genetics, explaining just what it means to patent a gene. The industry representatives were in a position to give the facts from an economic perspective, explaining what patenting means in terms of developing new drugs and getting them to market, or doing the basic research necessary to make advances in biotechnology possible. The religious representatives, of course, were in a position to comment on this complex reality from a moral perspective.

It makes sense to call this tripartite conversation a *dialogue* because it was a real encounter between the scientific and religious communities as they function in our socioeconomic system. For technologies like genetic testing or screening, industry is the primary means through which new knowledge affects people and takes on moral meaning. Most often, the scientific community does not develop a test under government sponsorship for the public benefit; rather, industry draws upon research results to develop a product for sale. If the purpose of a particular dialogue is to view entrepreneurial technology in a practical moral framework, industry is as important an interlocutor for religion as academic science. This was especially clear in the discussion of gene patenting, because the very subject of interest was an economic tool.

The religion-science-industry model holds great promise for the future. If it is to succeed, however, all parties must make their case straightforwardly. A good deal of the discussion of the May 1995 coalition statement revolved around the rather indefinite phrase "commodification of life." Some participants raised objections to patenting living things, whether they be whole organisms like the Harvard oncomouse or human body parts like genes, because it places a commercial value on the subjects of God's creation. The industry representatives obviously could not accept this stance, which tends to cast a shadow on much of current research. However, they failed to address the charge directly, which may reflect a certain moral intimidation. The result was a discordant undertone that subtly militated against a frank exchange of views among the three principal groups. The industry representatives never claimed a moral basis for their efforts, except to say they made useful products which, after all, was in their own interest. In an entirely evenhanded exchange, industry would point out the advantages of commercialization to society, while expecting responsible criticism of any excesses.

The structure of the DoSER experiment, three sessions spread over twelve months, was mostly dictated by circumstances. It had both advantages and disadvantages. Nearly every participant gave some sort of talk, as did a handful of guests. This format exposed the group to a very wide range of viewpoints and made for a rich discussion. The format also gave the participants a chance to digest what they heard before moving onto the next stage. On the other hand, time to digest is also time to forget. Staff had to devote considerable energy to maintaining continuity, distributing drafts and minutes from each session in preparation for the next. Schedule conflicts prevented some members from attending some sessions, so the composition of the group, though coherent enough for meaningful work, changed significantly in the course of the project. Finally, the scattered nature of the dialogue meant that the group had little sense of driving toward a goal. Although participants looked forward to continuing their discussion, they did not necessarily see successive sessions as milestones along a well-marked road.

If the Catholic dialogue series has been a clear but modest success, the DoSER discussion of gene patenting was a broadly conceived effort that only partly achieved its goals. The first is a miniature portrait that captures its subject nicely, the other a landscape that leaves the observer wanting a little more clarity of design and execution. It is important to recall, though, that gene patenting is only one of the topics DoSER is addressing. Since 1997, it has organized dialogues on genetic discrimination, germline intervention, evolution, and stem cell research. The program has great value because of its location within the largest scientific organization in the United States. Like the NCCB program, it is a symbolic bridge between two worlds once seen as rigidly separate. The statements the bishops' dialogues produce will probably reach only Catholics and people with a special interest in their content. DoSER, on the other hand, has the potential to influence the scientific community and even the public at large, because AAAS counts many journalists among its 145,000 members.

CONCLUSION

Direct religion-science dialogue, which probes the relationship between the two disciplines, is a well-established field. The work of such contemporary Christian scholars as Ian Barbour, Arthur Peacocke, John Polkinghorne, Józef Zycinski, Philip Hefner, Robert John Russell, and John Haught has given it a theoretical base, probing religion's relevance in a quantum-mechanical, evolutionary universe. Despite the efforts of organizations like the Institute for Theological Encounter with Science and Technology, however, the foundations of indirect dialogue are less clearly established. There is much room for experiment, and no one model is likely to serve under all circumstances.

The NCCB and AAAS programs offer valuable lessons for planners. Three points deserve special emphasis. First, indirect science-religion dialogue seems to exhibit a certain inverse proportion: the greater the diversity of the group, the less likely it is to yield a concrete product such as a joint statement, a policy position, or an agreement to take action. The Catholic bishops' dialogue features two relatively homogenous groups that agree to work (at least as far as the final product is concerned) within the constraints of the Catholic moral tradition. This simple framework has made it possible to issue quite definite and detailed statements on several subjects. The much more diverse DoSER initiative produced a lengthy book (Chapman 1999), certainly a significant accomplishment. However, this volume offers a range of views rather than a statement of common ground. Actual agreement would extend only to generalizations like "Patenting genes is not clearly immoral," and even these would represent majority opinions, not full consensus.

While too many cooks do not necessarily spoil the broth, they may determine its character. The Judaeo-Christian community in the United

States is so splintered that talking to it is talking to them. If one adds secular ethical viewpoints, industry, and perhaps some dispute over the scientific facts to the mix, consensus building rapidly becomes a daunting task. Thus, a commitment to consensus building sets practical limits on diversity. Planners can avoid frustration by defining their purposes before starting to work. If their goal is more ambitious than promoting a healthy exchange of views, they should assemble a group with a fair chance of achieving it.

Restricting membership is not the only way to address the problem of too many voices, however. A dialogue can be organized around a core of people who attend every session. These can provide continuity even in a large group through mutual friendship and a shared commitment to the goal. Both the Catholic bishops' discussions and the DoSER project had such core members. A dialogue can be set up with the understanding that staff will draft progressively precise consensus statements as the discussion proceeds, and that participants unwilling to sign on at any given point will excuse themselves. When a statement that the remaining members find substantive and complete is in hand, the project is finished. A dialogue also can be structured so that forty people have voice but only ten have vote. Imagination will suggest many other ways of balancing a desire for diversity with a desire for concrete results.

Second, the topics for science-religion dialogue should be chosen with care. The participants in the NCCB program agreed in advance to set aside the abortion question, even though it is plainly relevant to the discussion of genetic testing and screening. They found this strategy acceptable because their intent was to explore common ground, and there was plenty of room to do so. Most tests and screens, after all, are administered to children and adults. The members of the DoSER group could not set aside their conflict over the coalition statement because the patenting of living things was the subject at hand. Had the topic of the dialogue been "The Commercialization of Life" or "Biotechnology and the Capitalist System," they could have decided either to ignore gene patenting or to address it within a broader expression of commonality.

It is extraordinarily difficult, if not impossible, to discuss topics on which the dialogue partners or the groups they represent have taken public positions. The problem is not that people are rigid and cannot change their minds in response to sound arguments. Rather, those who engage in dialogue from the religious side are constrained by doctrine, those from industry by company policy, and those from science by an interpretation of the data. They cannot act in isolation, or wander far afield, without undermining their role as representative voices. The effect is most marked where a topic has been heavily politicized, because the sort of compromise that dialogue promotes can be seen as betrayal of a cause. As noted above, some of the religious leaders in the DoSER dialogue had no choice but to

condemn gene patenting, while the industry representatives had no choice but to defend it.

Put positively, partners in dialogue must have room to maneuver while remaining in their proper roles. From a religious perspective, the most promising topics for dialogue are technologies that scientific advance has recently thrust to the fore, because churches have not yet developed settled teaching on them. The dialogue becomes part of the church's effort to formulate a responsible position, applying moral, theological, and philosophical principles to the facts as they exist. It also benefits science and industry by helping them consider the consequences of developing a particular technology before they are intellectually and economically committed to it. It benefits society as a whole by helping ordinary people make informed judgments about the technology instead of simply responding to a television ad or a neighbor's new acquisition.

Third and last, both the NCCB and AAAS programs illustrate well the practical reality of indirect religion-science dialogue, which aims less to solve problems than to illuminate them. It is a search for wisdom, using the complementary human capacities to observe and reason about the physical world and to observe and reason about ourselves as spiritual, moral beings. This search is only partly an intellectual exercise. Dialogue between science and religion heals, it mends divisions born of habit and of pride, and it gives poor Galileo's ghost peace. The energy and good cheer characteristic of dialogue sessions reveal them as vital, hopeful, and open to the future. More than a meeting of the minds, they are a gathering of men and women willing to shed old prejudices and declare themselves, in their integral humanity, all on the same side.

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