Genetics and the Image of God

A Dialogue

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A church historian offers a summary of a dialogue between science and religion on the topic of genetics. He summarizes the remarks of two representatives of science and religion respectively, Dr. Francis Collins and Rev. James McCartney, O.S.A. Both are believers and both are concerned with providing a “correct understanding” of this field and its ethical ramifications and theological implications.

In the last decade, the world (literally) has witnessed an expanding dialogue between science and religion. The scope of interaction can be seen at websites dedicated to this movement (see References). In all of this activity, basic questions about the nature of the dialogue continue to arise: Is this a bona fide exchange between equals in which both parties affect one another’s understanding of the world? Or does science have the upper hand in defining the terms of discourse? Likewise, are religious communities, in a spirit of dialogue, ready to adjust belief in light of new knowledge—and to perceive that adjustment as an advance in theological understanding? In short, is this a true dialogue, and can creative interaction function as a method of theology? This essay seeks to address these questions with an eye toward their relevance for ministry.

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That these issues do concern theology and ministry can, at the outset, be suggested in two ways. Sir John Templeton, a principal sponsor of the cultural dialogue, has described his aim in theological terms. Through his foundation Templeton has underwritten much of this engagement in order to foster “humility theology.” He envisions progress in our knowledge of God through the application of scientific methods to spiritual phenomena. He promotes a method of interdisciplinary theological reflection based on an openness to scientific knowledge, on the one hand, and to spiritual reality on the other (Templeton 1998; Herrmann 2000). At the same time, in Catholic circles specifically, Pope John Paul II called for “intense dialogue.” He endorsed “mutual interchange” between scientific and religious communities, fostered by “bridging ministries” in the Church (John Paul II, 1988).

In this dual light, Church leaders might do well to consider both the aim and method of theology developed in dialogue with science. This essay takes a step toward this goal by closely examining one actual “dialogue.” The complexities of this cultural interaction are spotlighted, suggesting that interdisciplinary theological reflection and the formation of bridging ministries require not only an exchange of knowledge but a framework for developing understanding and wisdom.

**Setting and Context**

The dialogue took place at Washington Theological Union in the summer of 1999. It was part of a series of public “conversations” between scientists and theologians in the presence of a diverse audience. Each conversation explored the value of science for “our understanding and experience of God.” This particular exchange, entitled “Genetics and the Image of God,” focused on the implications of the Human Genome Project (HGP).

This dialogue had, and continues to have, a particular timeliness. Less than a year later, on June 26, 2000, the president of the United States announced completion of the rough draft of the human genetic code. Flanked by leaders of both the public and private efforts to map the human genome, President Clinton declared: “Today we are learning the language in which God created life.” Indeed, it seemed that only religious language could capture the momentousness of the occasion. Dr. Francis Collins, director of the international Genome Project, added: “We have caught a glimpse of an instruction book previously known only to God.” Rhetorically, at least, possession of the genetic map of the human being signaled a basic connection between science and religion (see Recer, 2000).

This connection had been anticipated. From its inception in 1990, the HGP dedicated 5 percent of its budget to explore the “Ethical, Legal and Social Implications” of research. The ELSI program sought a “safe and effective integration” of this knowledge into society, including ways that genetics “may interact with a
variety of philosophical, theological and ethical perspectives” (Collins and others, 1998). In this context, our particular dialogue might be seen as an exercise in public theology, part of an ongoing interdisciplinary effort to interpret the full meaning of “genomics.”

Our principal discussants embodied this effort. They included Francis Collins who, as a public official, noted that he spent as much time on ELSI issues as on the basic science. An accomplished geneticist and medical scientist, Collins is also a self-proclaimed “serious Christian” (Collins, 2003). Sharing the dais was the Reverend James McCartney, O.S.A., a bioethicist and philosopher of law and medicine at Villanova University. Active in healthcare ethics, McCartney has been recognized for his work on behalf of AIDS patients and on the concept of human personhood (Caplan and others, 2004). As an Augustinian priest, McCartney’s ministry can fairly be said to involve the cure of body, mind, and soul.

**A Symbolic Framework**

Collins began by offering a symbolic framework for the discussion. He juxtaposed two images: one looking “down the barrel” of the DNA molecule; the other, the rose window of York Minster cathedral (for images see Collins, 2003). Collins interpreted the “striking similarity” in two ways. For the man of both science and faith, the comparison made clear how science can evoke an experience of worship. “You get this sense of a beautiful, elegant system; [a sense] that we just learned something that God knew all along.” At the same time, this pair of images suggested how science can replace traditional religion with alternative symbols of inspiration. “I’ve certainly heard representations of that kind—sometimes even in churches where you would think they were close to taking the cross off the steeple and replacing it with the double helix.” Collins stressed, therefore, that faith communities had a special interest in assessing “DNA’s significance for us as human beings.”

McCartney offered an unrehearsed, theological commentary on Collins’ symbolism. He distinguished between the “iconic” and “idolatrous” aspect of genetics. Icons, he said, like those on a computer, point to an invisible reality. In religious terms, they truly if inadequately reveal the presence of God. By contrast, idols replace the divine with reflections of ourselves.

Idols absorb human gaze. We look around the world and our eyes fix upon something in creation. It could be a concept like genetics. We lock on these things as if they have the power to save, to bring us life and truth. Yet, we are their creators. . . . We make God that which is not God (see Marion, 1991).

For McCartney, “genetics, properly understood, is iconic.”
Right Understanding: A Scientist’s View

The dialogue, then, turned on the question of gaining right understanding. For his part, Collins pointed out that “getting the sequence [of human DNA] will just be a lot of letters unless we invest in methods to understand it.” Here he proposed both a general principle and a methodology for constructive dialogue. The method, which will become clear below, involved making careful distinctions. The principle was one of Collins’ “favorite” Scripture verses: “It is not good to have zeal without knowledge” (Prov 19:2). To enter into dialogue without being “well-informed by the facts,” he suggested, would be counterproductive. This requirement, he added, applied equally to scientists and theologians, since scientists “for the most part are ignorant of theology.” As a medical scientist, however, Collins stressed the importance of understanding the science.

To this end, he defined genetics as the study of genes or sections of DNA that carry instructions for the assembly of proteins and functioning of the entire organism. But the parts of the genes that code for protein make up less than 2 percent of the genome. Genomics is the study of all the DNA of an organism, including all of the regulatory information—not just the genes. A principal goal of the Human Genome Project (effectively achieved in 2000 and completed in 2003) has been the sequencing of human DNA. Information in DNA depends upon a particular sequence of chemical letters—A, C, G, and T. Each letter stands for a molecular base—Adenine, Cytosine, Guanine and Thymine—which link together to form the rungs of the double helix. Since a T always pairs with an A, and a G always pairs with a C, if “you know the sequence of one strand you can figure out what it must be for the other.” There are about 3 billion base pairs in human DNA, constituting an estimated 25,000 genes (apparently all that is necessary for our biological instruction book).

Knowing the sequence of chemical letters provides a genetic map of the human being. Once the map is known, Collins indicated, the real work of understanding begins. For the medical scientist, this means gaining a genetic understanding of disease. The map makes it much easier to identify and locate particular genes. Since most diseases have genetic contributions, genomics promises to greatly accelerate the pace of medical research. In sum, genetics has become the central science of medical research promising to produce the next generation of “blockbuster” cures.

Another product of this knowledge, and another goal of HGP, has been to determine where we differ. Variations in the genome sequence are common (there...
is no “normal” sequence). Some of these differences constitute genetic flaws or “ticking time bombs” set to go off in the proper environment. (Since all of us have dozens of these flaws, Collins dubbed this biological condition “the genetic equivalent of Original Sin.”) Some common variations are the likely causes of common illnesses, like Alzheimer’s or asthma. At the same time, the study of human variation reveals that we are much more alike than different. Individual human DNA is 99.9 percent identical. This similarity, Collins noted, means that “separating human populations into precisely defined racial categories is scientifically unjustifiable.” It also supports the theory of evolution by highlighting genetic relatedness among human population groups and between species (the DNA of a chimpanzee, for example, is 98.8 percent identical to human DNA).

In his interpretation of genomics, Collins paused here to consider the theological implications. He acknowledged that, regarding evolution, “my role as a scientist and my role as a person of faith obviously require some harmonization.” He described his view as “theistic evolutionist”—an understanding shared by a number of other evangelical Christians who are scientists, perceiving God creating through evolution (see the American Scientific Affiliation report cited at the end of this article). “For me the compelling argument is that if God set about to create humans, and if God is not limited by time, then wouldn’t evolution be a wonderful mechanism to achieve that goal? . . . It’s incredibly elegant.”

In a similar vein, Collins raised the question: “Is this [research] in concordance with God’s intention for us as human beings—to be doing something as fundamental as studying our own DNA?” He acknowledged that, as a physician, “it would not be surprising” that he would answer yes. Noting how often the gospels speak of Christ healing the sick, he observed that “as children of God” we are called to do the same. “If you accept that research that promotes [healing] is ethical activity, then genetics, which is our strongest tool right now, falls under that umbrella.” For Collins, the value of genetics for medicine makes its pursuit both a moral duty and religious calling—making the work of understanding critical.

Right Understanding: A Theological Perspective

McCartney sympathized with Collins’ view. “As co-creators, we are called to use our intellect to understand genetic processes, and to use them to improve the life of the planet and human flourishing.” This anthropological position emerged from McCartney’s theological reflection, itself shaped by dialogue with science. Seeking to define the “revelatory value” of genetics, he drew upon Scripture, Tradition, and science to outline a trinitarian theology.

McCartney began with his own biblical admonition: “No one has ever seen God” (John 1:18; 1 John 4:12). In our created state we always image the Divine.
These images, again, can be either idolatrous or iconic. They reflect our own lived experience and understanding of the world. Believers also draw upon the experience of God as narrated in the Bible and testified to in tradition. With these sources for reflection (informed also by process thought and evolutionary theology), McCartney offered an image of the Triune God in keeping with religious tradition and in tune with scientific knowledge (see Pittenger, 1979; Teilhard de Chardin, 1969).

As Creator, God is One, the “originary source of all being,” intimately involved in creation from the beginning. McCartney described this intimacy in terms of “spiritual energy”—a metaphor for divine presence linking scientific and religious understanding. A dynamic creation, McCartney suggested, is revealed in both genetics and Genesis. The DNA molecule, as the instrument of likeness and difference, stability and diversity, becomes an icon of the God revealed in Scripture as the source of order out of chaos, of both continuity and change.

For Christians, this divine engagement is “perfectly manifested” in Jesus Christ. In the Word made flesh, the decisive activity of God in creation is made known. In the second Person of the Blessed Trinity, the “I-Thou relationship” at the heart of the divine life is revealed. In Christ, McCartney concluded, God is revealed as dual, and there are wonderful hints of this divine duality in science, especially in genetics. The double helical form of DNA epitomizes this dual relationality (for more examples see Templeton and Herrmann, 1999). “It seems as if genetics is revealing to us the presence of a spiritual energy that has harmony and synchronicity as defining characteristics.” Moreover, this energy can be described as centripetal, bringing things together, revealing the God of love.

Third, God is revealed in Christianity and in genetics as “plural.” McCartney argued that the New Testament depicts the Spirit of God “as creative change and diversity itself.” He cited Acts 2:4 in which the disciples are filled with the Holy Spirit, receiving the capacity to speak in many tongues. In terms of spiritual energy, this aspect of divine activity is “centrifugal”—moving out from the center, “creating new possibilities,” encouraging variation and difference. In this theological light, the change and diversity evident in genetics again takes on revelatory value.

For McCartney, then, “contemporary genetics suggests an image of God that is trinitarian, but it is a trinity of number: singular, dual, and plural.” This divine image, McCartney added, does not deny a Trinity of Persons. However, to the
extent that a Trinity of Persons has ceased to be helpful iconically (“revealing to people the living God”), then perhaps “through an understanding of genetics we can get a more full image of the Divine within which we can place the Trinity of Persons.” Analogous to progress in science, the truth of the initial doctrine remains; its limitations are better understood. Ultimately, this contemporary image of the Triune God bore particular consequences for creatures created in that image.

**Ethical Knowledge**

In fact, for both discussants the quest for understanding led to a discussion of human responsibility and the ethical use of genetics. Collins, after characterizing genomics as a moral duty, quickly added: “That doesn’t mean that everything that you do with genetics is a good thing.” Careful distinctions had to be made—first and foremost between the medical and non-medical consequences of the science.

In medicine, Collins said, identifying a disease gene is just “the start. Once you’ve got it, the consequences can be considerable.” For example, genomics facilitates the development of genetic tests which can determine one’s risk for a particular disease. Such diagnostic tools would be good, Collins said, “if you have a preventative medicine strategy in place.” Likewise, in the emerging field of pharmacogenomics, knowledge of one’s particular genetic make-up could lead to drugs designed for the individual, avoiding adverse side effects. Further down the road, the development of gene therapies would either “prevent the disease altogether or treat it effectively once it has started.” In general, Collins envisioned a future of “genetic medicine” in which healthcare would be largely based on knowledge of genetic endowment.

This vision, Collins acknowledged, raised a number of ethical questions. “One of the questions many people are now asking is: would it be a good thing if you knew what your flaws were?” For Collins, a yes depended upon a number of social factors, including: laws to prevent discrimination in health insurance and employment; assurance that genetic tests are accurate, since choices made on the basis of this information could easily lead to life-altering decisions; effective oversight of testing procedures to ensure reliability; and trained genetic counselors.

Finally, Collins pointed to a number of “non-medical consequences” which he felt most urgently called for a science-religion dialogue. While acknowledging a genetic basis for the range of human characteristics, he seriously challenged the claim, often appearing in the popular press, that genes play a strong role in determining personality or behavior. As a man of faith and science, he was particularly perturbed by one *Time* headline: “Infidelity: It May Be in Our Genes” (April 15, 1994). “Well, there’s permission if you needed it. It’s not your fault. It’s
Not only are such claims scientifically untenable, Collins argued, but to cite only heritable and nonheritable (environmental) causes for emotional states or life choices rules out our decision-making capacity—“a complicated issue which studying our DNA will never understand.” He wondered: “What happened to free will? What happened to our relationship with God? . . . What about Philippians 4:6: ‘Be anxious for nothing’? That’s hopeless. You have no choice.”

In this case, ethical knowledge (i.e., wisdom, as noted in Moltmann, 2003) seemed to require both an expert’s assessment of the limits of science and insight from other sources. On the one hand, Collins suggested that scientists “ought to do better” to clarify the limits of genetic determinism (ostensibly to curtail one type of zeal without knowledge). At the same time, he called upon “people of faith to take on the responsibility to be sure that the utilization of that knowledge be done in ways that God would not disapprove of.” In particular, Collins raised the very real question of how genetics should be used “in choosing the characteristics of our offspring.” He maintained that “for most of the things that people are talking about—like intelligence or physical attractiveness—DNA is very weakly determinant; the number of genes involved will be very large; and the ability to be very precise in selecting the characteristics of your offspring will be pretty lousy.” Nevertheless, he conceded that parents with access to the relevant genetic technology will likely seek the advantages genetics can offer. “Should we try,” Collins wondered, “to put up any kind of barriers or should we simply let couples do what couples want to do?” An underlying difficulty here lay in the inability to distinguish clearly between diseases and traits. Collins couldn’t say, for example, when obesity becomes a disease. Given the uncertainty, “we may not have state-mediated eugenics, but we might have homemade eugenics where couples that have the resources . . . can tweak the characteristics of their offspring using DNA technology.”

McCartney drew upon his trinitarian theology to address these ethical questions. In general, he said, “If humans are created in the image of the Divine narrated in the Bible and revealed iconically in genetics, then we are called to creativity, to love, and to diversity.” This three-part call, and our response to it, is itself not without uncertainties. The call to imitate the creativity of God, for example, aims for the human good; but our creative actions surely have unintended consequences. For McCartney, as for Collins, the ambiguity highlighted the need for prudence. At the same time, the susceptibility to error and evil ought not
forestall the pursuit of knowledge, nor prevent its proper understanding and ethical use. Citing a principle from Catholic moral theology, McCartney offered a guideline for that use: “abusus non tollit usus”—just because something can be abused doesn’t mean its legitimate use should be taken away.” Ongoing dialogue, he suggested, would be needed to define legitimacy.

**Conclusion**

In his 1988 call for “a more thorough-going dialogue” between science and theology, Pope John Paul II expressed a sense of urgency. In the recent past, he noted, “The uses of science have on more than one occasion proved massively destructive, and the reflections on religion have too often been sterile.” He outlined a process of “mutual learning” in which each discipline would retain its distinct integrity; each would serve as an important resource of understanding for the other; and each would learn its limitations. This dynamic “relational unity” would constitute both a form of interdisciplinary theological reflection and a common ministry. In the Pope’s words: “We need each other to be what we must be, what we are called to be” (Pope John Paul II, 1988).

Our actual dialogue reflects something of the nature of and challenges to this mode of theology and ministry. In particular, it suggests the complexity of the role for “bridging ministries” envisioned by the Pope. Both Collins and McCartney personify this “key resource” in the “community of interchange”: men and women of faith who are active scientists or who are trained in both disciplines and who can help others integrate the worlds of science and religion or make “moral decisions in matters involving technological research and application” (Pope John Paul II 1988, m. 12). On a personal level, Collins’ and McCartney’s integration of commitments to both scientific and religious truth implies a dynamic internal process of dialogue for such a ministry. On a public level, the delicacy of urging scientists (and others in a scientific culture) to acknowledge the limits of science, while encouraging religious believers to amend their beliefs, suggests the controversial character of this ministry. At the same time, its interdisciplinary nature bears important implications for the structure and content of theological education (as the Pope himself acknowledged). Ultimately, our conversation points to a dialogic form of public ministry opened and dedicated to a broad cultural movement converting knowledge into understanding and wisdom.

**References**


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