

CHAPTER 1

The Call for a Christian Cosmology

... for the world, which seems
To lie before us like a land of dreams,
So various, so beautiful, so new,
Hath really neither joy, nor love, nor light,
Nor certitude, nor peace, nor help for pain.

Matthew Arnold's poem "Dover Beach" expresses a recurring theme of twentieth-century thought and literature: the faith milieu, which once lent enchantment to the world, has departed, and now modern men and women find themselves isolated, alone, and without faith in a hostile and alien world.

Obviously, the poet does not speak for everyone. The majority, among Americans at least, continue to believe in God, and some of them pray seriously and consistently enough to experience hope, love, and joy, and to receive help in times of suffering. But there are also many who do not or cannot believe, and some of them react to their situation with the kind of sadness and pessimism depicted by Arnold. The general milieu tends to erode faith and put a damper on hope and joy. At the beginning of the sixteenth century, our ancestral home, the Earth, was a stable and fixed place at the center of the universe. The crystalline spheres, in which the stars were fixed, revolved around us. Beyond them lay the heavenly realm, which was the home of God. But within two or three centuries Western culture has changed radically, and now humanity finds itself on a small and apparently insignificant planet circling around an ordinary star on the outskirts of an average galaxy in an enormous universe.

Thus, there were many questions that sixteenth-century people could not answer but that we can, at least up to a point. What are the stars and why do they shine? Why is the grass green? Whence come the winds and the tides? What are fire and lightning? Why do people get sick? What is the meaning of the similarities and differences between living beings? What is life? And so on. But there were also many questions that the medievals could answer and that many moderns cannot—ones that are ultimately far more important: Where do I come from and where am I going? What are my nature and destiny? How did the world come into being and why? What may I hope for? What should I do?

One of the important driving forces behind this cultural change was the rise of science and scientific technology. Science has transformed our view of some aspects of reality and given us satisfying answers to many questions. At the same time it has, to some degree at least, resulted in confusion about our nature and destiny, about morality and goals. In conjunction with technology, it threatens our destruction and gives us only limited advice about how to save ourselves. Partly as a result of modern technical productivity there has been a shift in interest from happiness after death to happiness before death, from spiritual goods to material goods, from salvation by God to human progress. As one ponders the contrast between the medieval and the modern world, one wonders who are the wiser and who the happier? Our society as a whole has no definite answer to these questions, partly because the answer depends upon the values we espouse, and as a group we are confused about values.

My own view of what has happened can be expressed in terms of an insight of Michael Polanyi. He points out that “we usually cannot tell how we recognize a face we know” (1967, 4). The particulars of a face are known only tacitly or implicitly in attending to the face as a whole. If one begins to attend explicitly to the shape of the nose, or the position of the eyes, and so on, one loses the vision of the face. Similarly, a golfer who begins focusing on the position of his elbow or the movement of his hips may lose his feel for the golf swing as a whole. Once Western people knew the detailed structure of nature only very imperfectly, but for them its various features coalesced in a comprehensive vision of reality. Today we

understand the particular structures of nature much better, but many of us are unable to integrate them into an overall gestalt. Nobel laureate physicist Steven Weinberg expresses this modern predicament when he writes, “the more the universe seems comprehensible, the more it also seems pointless” (1993, 154).

Our philosophical and religious confusion is a serious problem for everyone, even for those who reject any kind of religious faith or metaphysical view of reality as a whole. The Nobel biologist Jacques Monod made no bones about his conviction that the world is governed by chance and necessity rather than divine providence. Nevertheless, he expressed serious concern about the effects of this conviction on society:

There is no doubt at all, it cannot be doubted that what we might call superstitions or untenable religious myths, or philosophies, have a function. They have a social function, that is to say, establishing a basic system of values upon which society can be organized so that their value in this coherence of societies cannot be doubted. Really the fundamental question is whether we can do without that kind of ideology, and yet have one that will allow society to function; this is uncertain. I think that Karl Popper’s great friend, Professor Hegel, said somewhere that religion is the basis of ethics and that ethics is the basis of the state and therefore we must have religion, and here you are! (Monod 1974, 374)

What is to be done? We cannot return to the age of scientific innocence. Rather, like the golfer who once had a natural swing and has now grown inhibited as a result of trying to improve it, we must strive for a higher kind of integration. The achievements of science must be integrated into a comprehensive vision that will give meaning and significance to science as well as to all the other aspects of human life. The Aristotelian-Thomistic cosmology of the medieval period died hard because in spite of its deficiencies it supplied a worldview that united secular experience with the transcendent. It may not be possible to get everything into such a neat package again. Indeed, even if it were possible it might not be desirable, for science and religion are distinct enterprises with their own distinctive principles and procedures. The experience of

the past four centuries shows that it is unwise to make these two disciplines too dependent on one another lest they be contaminated by one another's errors. But neither would it be wise to divide them into two distinct universes of discourse. I believe that these distinct entities can be united to form an articulated whole whose parts are in harmony. Perhaps their unity cannot be as stable and permanent as they themselves, but it might perhaps be beautiful and useful for our own times. I feel sure that we can approach this ideal of integration much more closely than we do at present.

JOHN PAUL II ON SCIENCE, PHILOSOPHY, AND THEOLOGY

The term "humanism" is often used to signify an anthropocentric point of view in which mere human beings are at the center. For those who accept that kind of humanism, the rest of the universe, and even God (if God exists), is understood and valued in terms of its importance to mankind. In his book *Crossing the Threshold of Hope* (1994a), Pope John Paul II spoke about human dignity in a different way. For the Pope, humanity as such is not the center. Our great dignity comes from our relationship to God as he reveals himself in the incarnate Logos, Jesus Christ. The Pope was therefore a "humanist," but a Christian humanist centered on Jesus Christ rather than on merely human creatures. For him, the rights and the dignity of mankind come from God in Christ, and he is sure that without our relationship to God we would possess little or no real dignity or rights at all.

John Paul confessed that he never had a special predilection for science but has rather been fascinated by humanity. He recalls that, after the Communists seized power in Poland, one might have expected that the cultural struggle would center around the philosophy of science and of nature in general. But in fact it soon became a struggle over the nature, dignity, and morality of human beings (John Paul II 1994a, 199). Nevertheless, the Pope admired science's magnificent accomplishments and recognized not only its humanistic importance but also its strictly intellectual and technological value. This view was expressed in the

message he sent to the study group that assembled at Castel Gandolfo near Rome on September 21–26, 1987, to commemorate the three hundredth anniversary of the publication of Newton's *Philosophiae naturalis principia mathematica* (*The Mathematical Principles of Natural Philosophy*). Near the beginning of that message he stated that the theme of the conference (expressed in the title of its proceedings, *Physics, Philosophy, and Theology: A Common Quest for Understanding*) "is assuredly a crucial one for the contemporary world," and for this reason he wished to address some of the issues involved (John Paul II 1988, 1995, p. m1).

He begins with an overview of the world situation: Our world is fragmented and disjointed, filled with warring factions. Yet at the same time there is a growing awareness of the need for unity and reconciliation. The Church has entered into this movement for unity and is striving to foster it. One aspect of this striving is concerned with the "definite, though still fragile and provisional, movement" toward a better relationship between science and religion (p. m4). "It is crucial that this common search based on critical openness and interchange should not only continue but also grow and deepen in its quality and scope" (pp. m4–m5). The impact that both religion and science have "on the course of civilization and on the world itself, cannot be overestimated, and there is so much that each can offer the other" (p. m5).

From the viewpoint of the Church, "the unity we perceive in creation on the basis of our faith in Jesus Christ as Lord of the universe, and the correlative unity for which we strive in our human communities, seems to be reflected and even reinforced in what contemporary science is revealing to us. . . . Contemporary physics furnishes a striking example" in its quest for a final unifying theory of matter (p. m6). The life sciences exhibit a similar movement with the new understanding achieved by molecular biology of the unity of life on this planet.

The unity the Pope seeks to encourage "is not identity" (p. m8). Religion and science each have their own proper integrity, which would be compromised by any attempt to reduce one to the other. The unprecedented opportunity we have today is for a common interactive relationship

in which each discipline retains its integrity and yet is radically open to the discoveries and insights of the other.

But why is critical openness and mutual interchange a value for both of us? Unity involves the drive of the human mind towards understanding and the desire of the human spirit for love. When human beings seek to understand the multiplicities that surround them, when they seek to make sense of experience, they do so by bringing many factors into a common vision. Understanding is achieved when many data are unified by a common structure. The one illuminates the many; it makes sense of the whole. Simple multiplicity is chaos; an insight, a single model, can give that chaos structure and draw it into intelligibility. We move towards unity as we move towards meaning in our lives. Unity is also the consequence of love. If love is genuine, it moves not towards the assimilation of the other but towards union with the other. Human community begins in desire when that union has not been achieved, and it is completed in joy when those who have been apart are now united. (p. m9)

Theology has been defined as an effort of faith to achieve understanding as *fides quaerens intellectum* [faith seeking understanding]. As such, it must be in vital interchange today with science just as it always has been with philosophy and other forms of learning. Theology will have to call on the findings of science to one degree or another as it pursues its primary concern for the human person, the reaches of freedom, the possibilities of Christian community, the nature of belief and the intelligibility of nature and history. The vitality and significance of theology for humanity will in a profound way be reflected in its ability to incorporate these findings. (p. m10)

This point must be carefully qualified. Theology does not judge, nor is it judged by, the validity of properly scientific findings. But it should take them seriously and see what resources they afford for the performance of its own proper task. “Theologians might well ask, with respect to contemporary science, philosophy and the other areas of human knowing, if they have accomplished this extraordinarily difficult process [of integrating science into their thought] as well as did these medieval masters” (p. m11).

Pursuing such questions “would entail that some theologians, at least, should be sufficiently well-versed in the sciences to make authentic and creative use of the resources that the best-established theories may offer them.” Such expertise would prevent both “uncritical and overhasty use” of science “for apologetic purposes,” as well as neglect of really relevant ideas. In this process believers who are active scientists (and even in some cases both scientists and theologians) “could serve as a key resource.”

The matter is urgent. Contemporary developments in science challenge theology far more deeply than did the introduction of Aristotle into Western Europe in the thirteenth century. Yet these developments also offer to theology a potentially important resource. Just as Aristotelian philosophy, through the ministry of such great scholars as St Thomas Aquinas, ultimately came to shape some of the most profound expressions of theological doctrine, so can we not hope that the sciences of today, along with all forms of human knowing, may invigorate and inform those parts of the theological enterprise that bear on the relation of nature, humanity and God? (p. m12)

Ten years later, in September 1998, John Paul issued an encyclical entitled *Faith and Reason* (in Latin, *Fides et Ratio* [FR]), which is concerned about matters closely related to those discussed in his message of 1988. *Faith and Reason* begins with a vivid metaphor: “Faith and reason are like two wings on which the human spirit rises to the contemplation of truth; and God has placed in the human heart a desire to know the truth—in a word, to know himself—so that, by knowing and loving God, men and women may also come to the fullness of truth about themselves (cf. Ex. 33:18; Ps 27:8–9; 63:2–3; Jn. 14:8; 1 Jn. 3:2)” (§1).

Faith and Reason relies upon the documents *Dei Filius* of the First Vatican Council and *Dei Verbum* of the Second Vatican Council. Both Councils insisted upon the radical distinction between revealed truth and the truth that the human mind can attain by its own natural efforts. Yet they also insisted that truth is one and that both revealed truth and natural truth cannot contradict one another. Rather, when properly understood, they confirm and harmonize with one another. Thus, as I

did in the preface, one can distinguish three kinds of truths: (1) truths whose intrinsic intelligibility surpasses the scope of human reason and can be known only by divine revelation, (2) truths that can be grasped by human reason through its own efforts and so do not need to be divinely revealed in order for us to know them, and (3) truths that ideally could be attained by human reason but that, in the present sinful order of things, cannot actually be known, at least widely, clearly, and with certainty, without the help of revelation.

Human beings can easily deny or misunderstand natural truths—and even more easily divine ones. But it seems that it is in dealing with the third kind of truth that error becomes most acute. There the Church (or, perhaps better, churchmen) has made some bad mistakes and has sometimes been reluctant to admit them—as, for example, in the case of Galileo or with regard to the eternal salvation of Jews, Muslims, and other non-Christians. Whether they are scientists, philosophers, or theologians, all human beings are prone to error in this area. Specialized groups often need one another's help to untie the knots that arise. Speaking to bishops and other Christians, the Pope reminds them that “even in the philosophical thinking of those who helped drive faith and reason further apart there are found at times precious and seminal insights which, if pursued and developed with mind and heart rightly tuned, can lead to the discovery of truth's way” (FR §48).

CHRISTIAN COSMOLOGY

In medieval times, the vision of reality held by educated people was identified largely with Christian theology and philosophy. Now this vision has expanded greatly. As a result, educated Christians aspire to an understanding that spans not only current Christian theology and philosophy but also modern science, including not only the physical sciences but also psychology, anthropology, sociology, and so forth. What should such a modern vision of the world be called? Let us call it “Christian cosmology.” It involves adjusting the “boundary conditions” between the relatively distinct disciplines of theology, philosophy, and science in such a

way as to permit them to form a single integrated yet also articulated body of knowledge, a “one” that includes “many.” Such a kind of knowledge is speculative and therefore inevitably fragile. It has to pay close attention to seemingly well-established results of Christian theology, philosophy, and science, yet it cannot afford to be controlled by them. For none of the latter are themselves divine revelation but are rather the results of limited human judgments. Christian cosmology knows that there is but one truth, and therefore it also knows that ideal theology, philosophy, and science cannot contradict one another. If they seem to do so, it is because at least one of them is mistaken.

At least occasionally, serious problems have resulted from boundary disputes between Christian theology and science. To some extent such disputes are inevitable, due simply to the fact that human knowledge and human methodologies are limited and imperfect. But sometimes they are the result of intellectual imperialism on the part of either scientists or theologians or both. In the days of Galileo, the theologians had social power, and some of them made bad mistakes by using it wrongly. Today the scientists may have more of it, and some of them are in turn making bad mistakes by using it wrongly. The great theories of modern science (namely, quantum mechanics, relativity, and biological evolution) are to some extent in disagreement with Christian philosophy and theology, as well as with one another. With regard to differences between quantum mechanics and relativity, on the one hand, and Christian theology, on the other, disagreements are not very acrimonious. Indeed, they are sometimes hardly noticeable—partly, I believe, due to the fact that relatively few theologians are very interested in cosmology and most modern theologians are not ready to disagree with science on what seems to be the latter’s own home ground. Furthermore, physicists themselves generally admit that there is something wrong with quantum mechanics and/or relativity, and they want to change one or both of them in order to arrive at a more adequate, synthetic theory.

But with regard to the theory of biological evolution, the situation is different. To put it bluntly, I think that some evolutionary biologists are not only attacking religious dogmas precious to billions of human beings

but, in doing so, are even misinterpreting science itself. I wish they would desist, or at least that other scientists would call them to task. But I see little likelihood of that happening soon. I will return to this matter below.

THE FAITH OF SCIENTISTS

The truth about the objective relationship between science and religion is one thing; the attitude of living scientists toward religion is another. In the September 1999 issue of *Scientific American*, Edward J. Larson and Larry Witham reported the results of a survey that they conducted in 1996 and 1998. They followed in the steps of psychologist James H. Leuba, who in 1914 and again in 1933 asked American biological and physical scientists what their views were regarding “the two central beliefs of the Christian religion; a God influenced by worship, and an after life” (Larson and Witham 1999, 89).

Leuba’s survey had two parts in both 1914 and 1933. The first part addressed the two questions to a random sample of scientists listed in *American Men and Women of Science*; the second part addressed a group of scientists designated by the same reference work as eminent in their field. As to scientists in general, in 1914 Leuba found that 40 percent said they believed in a personal God, and 50 percent said they believed in personal immortality. But the percentages he obtained from his “greater” scientists were lower; fewer than a third expressed belief in a personal God and a slightly larger percentage in immortality. When he repeated his survey in 1933 Leuba found that scientists in general answered his questions in about the same way. However, his sample of eminent scientists showed higher levels of doubt. More than 80 percent of the eminent scientists said no to both questions.

In 1996 and 1998, Larson and Witham repeated the same questions to scientists of the same two categories. Scientists in general were selected from *American Men and Women of Science*; “eminent scientists” were members of the biological and physical sections of the (American) National Academy of Sciences (NAS). About 40 percent of the general group said yes to both questions. On the whole, the percentages for this

group had not changed very much since 1914. However, the percentage of the eminent scientists who said yes was much lower.

Disbelief among NAS members responding to [the] survey exceeded 90 percent. . . . NAS biologists are the most skeptical, with 95 percent . . . evincing atheism and agnosticism. Mathematicians in the NAS are more accepting: one in every six of them expressing belief in a personal God. (Larson and Witham 1999, 90)

With regard to the past century in the United States, Larson and Witham comment:

[W]hat stands out is an image of American natural science that has not fundamentally changed since 1914. Measured by religious belief, professional science is like a pyramid, or a three-tiered ziggurat. At the top is acute disbelief. Scientists in the middle are significantly less believing (by more than half) than citizens in general. The wide and heavy base is more firmly sunken into religious America—evidence suggests that there is more personal religion among physicians, engineers and members of other technological occupations that involve applied science. (Larson and Witham 1999, 90)

These conclusions of Larson and Witham regarding the religious faith of American scientists cohere with the common opinion that in the West supernatural faith has been declining among intellectuals ever since the rise of modern science and technology some three hundred years ago. The reasons for this phenomenon are complex. There are many factors, but one of them is the specialization that has become very common in modern culture, especially among scientists. Specialization makes people sensitive to some aspects of reality, but it can also render them oblivious to others.¹ The problem can be expressed in terms of the metaphor of “horizon.”

Literally, a horizon is a maximum field of vision from a determinate standpoint. In a generalized sense, a horizon is specified by two poles, one objective and the other subjective, with each pole conditioning the other. (Lonergan 1968, 211)