The Holy See

ADDRESS OF HIS HOLINESS BENEDICT XVI TO THE MEMBERS OF THE PONTIFICAL ACADEMY OF SCIENCES

Monday, 6 November 2006

Your Excellencies,
Distinguished Ladies and Gentlemen,

I am pleased to greet the members of Pontifical Academy of Sciences on the occasion of this Plenary Assembly, and I thank Professor Nicola Cabibbo for his kind words of greeting in your name. The theme of your meeting – "Predictability in Science: Accuracy and Limitations" – deals with a distinctive attribute of modern science. Predictability, in fact, is one of the chief reasons for science's prestige in contemporary society. The establishment of the scientific method has given the sciences the ability to predict phenomena, to study their development, and thus to control the environment in which man lives.

This increasing 'advance' of science, and especially its capacity to master nature through technology, has at times been linked to a corresponding 'retreat' of philosophy, of religion, and even of the Christian faith. Indeed, some have seen in the progress of modern science and technology one of the main causes of secularization and materialism: why invoke God's control over these phenomena when science has shown itself capable of doing the same thing? Certainly the Church acknowledges that "with the help of science and technology…, man has extended his mastery over almost the whole of nature", and thus "he now produces by his own enterprise benefits once looked for from heavenly powers" (*Gaudium et Spes*, 33). At the same time, Christianity does not posit an inevitable conflict between supernatural faith and scientific progress. The very starting-point of Biblical revelation is the affirmation that God created human beings, endowed them with reason, and set them over all the creatures of the earth. In this way, man has become the steward of creation and God's "helper". If we think, for example, of how modern science, by predicting natural phenomena, has contributed to the protection of the environment, the progress of developing nations, the fight against epidemics, and an increase in life expectancy,

it becomes clear that there is no conflict between God's providence and human enterprise. Indeed, we could say that the work of predicting, controlling and governing nature, which science today renders more practicable than in the past, is itself a part of the Creator's plan.

Science, however, while giving generously, gives only what it is meant to give. Man cannot place in science and technology so radical and unconditional a trust as to believe that scientific and technological progress can explain everything and completely fulfil all his existential and spiritual needs. Science cannot replace philosophy and revelation by giving an exhaustive answer to man's most radical questions: questions about the meaning of living and dying, about ultimate values, and about the nature of progress itself. For this reason, the Second Vatican Council, after acknowledging the benefits gained by scientific advances, pointed out that the "scientific methods of investigation can be unjustifiably taken as the supreme norm for arriving at truth", and added that "there is a danger that man, trusting too much in the discoveries of today, may think that he is sufficient unto himself and no longer seek the higher values" (*ibid*., 57).

Scientific predictability also raises the question of the scientist's ethical responsibilities. His conclusions must be guided by respect for truth and an honest acknowledgment of both the accuracy and the inevitable limitations of the scientific method. Certainly this means avoiding needlessly alarming predictions when these are not supported by sufficient data or exceed science's actual ability to predict. But it also means avoiding the opposite, namely a silence, born of fear, in the face of genuine problems. The influence of scientists in shaping public opinion on the basis of their knowledge is too important to be undermined by undue haste or the pursuit of superficial publicity. As my predecessor, Pope John Paul II, once observed: "Scientists, precisely because they 'know more', are called to 'serve more'. Since the freedom they enjoy in research gives them access to specialized knowledge, they have the responsibility of using that knowledge wisely for the benefit of the entire human family" (*Address to the Pontifical Academy of Sciences*, 11 November 2002).

Dear Academicians, our world continues to look to you and your colleagues for a clear understanding of the possible consequences of many important natural phenomena. I think, for example, of the continuing threats to the environment which are affecting whole peoples, and the urgent need to discover safe, alternative energy sources available to all. Scientists will find support from the Church in their efforts to confront these issues, since the Church has received from her divine founder the task of guiding people's consciences towards goodness, solidarity and peace. Precisely for this reason she feels in duty bound to insist that science's ability to predict and control must never be employed against human life and its dignity, but always placed at its service, at the service of this and future generations.

There is one final reflection that the subject of your Assembly can suggest to us today. As some of the papers presented in the last few days have emphasized, the scientific method itself, in its gathering of data and in the processing and use of those data in projections, has inherent

limitations that necessarily restrict scientific predictability to specific contexts and approaches. Science cannot, therefore, presume to provide a complete, deterministic representation of our future and of the development of every phenomenon that it studies. Philosophy and theology might make an important contribution to this fundamentally epistemological question by, for example, helping the empirical sciences to recognize a difference between the mathematical inability to predict certain events and the validity of the principle of causality, or between scientific indeterminism or contingency (randomness) and causality on the philosophical level, or, more radically, between evolution as the origin of a succession in space and time, and creation as the ultimate origin of participated being in essential Being.

At the same time, there is a higher level that necessarily transcends all scientific predictions, namely, the human world of freedom and history. Whereas the physical cosmos can have its own spatial-temporal development, only humanity, strictly speaking, has a history, the history of its freedom. Freedom, like reason, is a precious part of God's image within us, and it can never be reduced to a deterministic analysis. Its transcendence vis-à-vis the material world must be acknowledged and respected, since it is a sign of our human dignity. Denying that transcendence in the name of a supposed absolute ability of the scientific method to predict and condition the human world would involve the loss of what is human in man, and, by failing to recognize his uniqueness and transcendence, could dangerously open the door to his exploitation.

Dear friends, as I conclude these reflections, I once more assure you of my close interest in the activities of this Pontifical Academy and of my prayers for you and your families. Upon all of you I invoke Almighty God's blessings of wisdom, joy and peace.