

Magisterium of Catholic Church

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I. Introduction

The events narrated in the New Testament introduce the twelve apostles, with Peter as their head, who are entrusted with the function of safeguarding and transmitting the teachings of Jesus Christ, especially his death and resurrection, whose universal redeeming significance is proclaimed in the very beginning of the spreading of the Gospel (cf. *Mt 16:18-19; Mt 28:18-20; Jn 20:21; Acts 2:42; Acts 10:37-43*). The term "Magisterium" of the Church indicates a teaching function (lat. *magister*, teacher), a duty towards the people of God. As the Second Vatican Council recalled, such a teaching is not above the Word received, but represents a service to the Word itself; a service inseparably bound to the living transmission of the Gospel (Lat. *Traditio*) and to the contents of [Sacred Scripture](#) (cf. *Dei Verbum*, n. 10). According to the Catholic perspective, the subject of the Magisterium are the bishops, who are the successors of the apostles, whose college only exists in communion with the bishop of Rome, successor of Peter. The latter is also the subject of a specific Magisterium who, presiding in charity, is intended to guard the truth and unity of the entire Church, whose permanence in the authentic evangelical faith is a concern of the whole episcopal college (cf. *Lumen gentium*, nn. 20-25). As a consequence of the protestant Reformation, the different Christian confessions that separated from Catholicism abandoned the idea of a binding Magisterium for the faith of the people of God (cf. *Unitatis redintegratio*, n. 21). The extended body of declarations regarding the Christian faith, which began with the greatest Councils of the first centuries and then matured throughout the many years that preceded the divisions, continues nevertheless to represent a common patrimony and deposit, together with the testimony of the Fathers of the Church.

The authoritative teaching of the Magisterium is different from theology, which represents a sapient and rational reflection on the content of the faith. Reflections or conclusions proposed by theology are accepted only on the strength of the rigor of its method and the accuracy of the results obtained in merit of its specific object, as well as what happens in other fields of knowledge (cf. *Donum veritatis*, nn. 21-24). In terms of the relationship with science, discourses or documents from the Magisterium of the Church seeking to clear up specific questions have been rare, at least until the end of the 19th century. However, throughout the 20th century they took on a certain actuality, especially after the Second Vatican Council (1962-1965). In a more general way, it should be affirmed that since the first Councils of the Christian Age, the Church has always been concerned about dialogue between the Gospel and culture; especially after the encounter between the Christian message and Greek-Roman philosophy.

The responsibility for comparing the content of faith with the results of science is more often borne by theology, which is called to interpret the contents of Judaeo-Christian Revelation in light of the knowledge proper to each age. Theological conclusions do not bind the faithful's faith, unless they are assumed by the Magisterium and taught by the latter in an authoritative way. In this article, we turn our attention exclusively to those topics on which the Catholic Magisterium, certainly not without the previous contribution of theology, has provided some official teachings, or at least recommendations of particular interest.

It is important to emphasize that declarations from the Magisterium are always seen within the context of the fundamental concerns of the Church which are pastoral in character, in other words, aimed at educating the faithful and fostering the spread of the Gospel message. When the various magisterial documents are read outside of this context and finality, we easily miss their true significance and run the risk of a superficial understanding of their meaning. In this sense, it should be noted that the Church has always paid particular attention to the cultural implications and expressions of all that is human, because the Christian message is above all a call to a change in mentality, rather than a mere code of conduct. It is therefore natural that the Church should be interested in science and technology, as well as other cultural and artistic expressions. Furthermore, she has done so insofar as scientific activity and technological progress have extended their sphere of influence, until becoming a determining factor of human life.

Despite a widespread image promoted by the mass media focused on contentious and controversial aspects, the nature and finality of the documents issued by the Church Magisterium is mainly that of showing the positive and constructive contribution of the Christian religious experience in the realm of research, rather than engaging in contentions or taking a specific position in controversial debates. This idea is demonstrated with particular efficacy in the teachings of John Paul II, who has dedicated major efforts to summarize and develop the Magisterium of the Second Vatican Council.

II. A Long-dating Concern of the Church: a Brief of History up until The Second Vatican Council

1. A Brief Historical Digression. The interest of the Church, and in particular of her authorities, in scientific questions can be dated back to the past. A personality such as the Bishop Albert the Great (1200-1280) developed a fundamental role in making science known as an authentic form of knowledge and is cited even today as an example of "Christian intellectuality" (cf. John Paul II, *Meeting with Scientists and Students in Cologne Cathedral*, November 15, 1980).

Generally, it can be said that the movement caused by the spread of Christianity in Western Europe has been of key importance in diffusing a form of knowledge that little by little will assume the physiognomy of modern scientific knowledge. According to the historian Stanley Jaki, the foundation of the intelligibility "was first placed firmly on a level transcending both man and nature during the Middle Ages and in a way that constituted a cultural matrix. It manifested a broadly shared conviction that a personal, rational, and provident Being, absolute and eternal, is the ultimate source of intelligibility insofar as he is the Creator of all things visible and invisible" (*The Road of Science and the Ways to God*, Chicago: Chicago University Press, 1978, p. 34) In this way it would explain the fact that science effectively made a name for itself only during the European Middle Ages, despite all the false starts of the previous great civilizations. The definition of the Fourth Lateran Council (1214), according to which the universe was created out of nothing at the beginning of time, would have had a relevant role in this matter. Such a definition establishes the contingency of the cosmos against the Aristotelian view of a cosmos necessary in itself, guaranteeing the possibility of a rational survey of a "created" nature.

Throughout the centuries, there have been bishops and popes who cultivated the sciences and promoted research initiatives dedicated to the diffusion of scientific knowledge. Only in the second half

of the 19th century did the need emerge to clarify some aspects of the relation between faith and scientific thought by means of authoritative and explicit pronouncements. Though before that time, and especially until the famous Galileo "affair," there had been problems and controversies, they were always treated as single events, mainly connected to personal and contextual matters that did not contribute to the generalized head-on collision between science and faith. The absence of strong clashing controversies was likely due to the general cultural context that accompanied science in its birth within the Middle Ages and then in the Modern Age; a context that did not deny religion and the authority of Bible. Such a still unified culture remained in the background and determined the attitude of those who operated in the field of science, preventing them from seeing any alternative or opposition between religion and science, understood as two ways of encountering and knowing reality. The reason why problems arose in a keener way only in the 19th century is more contingent. It mainly derives from the climate created starting in Europe with the Enlightenment and which flowed into the subsequent century through the controversy on Darwinism.

Indeed the First Vatican Council (1870) did not hesitate to declare the inexistence of opposition of faith with respect to the sciences, maintaining that the Church did not have anything to fear before the conquests of human reason, but rather encouraged these efforts (cf. *Dei Filius*, DH 3015-3020). In the meantime, theologians and Catholic scholars began a more systematic reflection on the topic, providing the background on which the discourses of the Popes were later to be developed, basically starting with Leo XIII (1878-1903). In his Encyclical *Immortale Dei* (1885), in making an explicit reference to science, Leo XIII writes: "[...] as all truth must necessarily proceed from God, the Church recognizes in all truth that is reached by research, a trace of divine intelligence. And as all truth in the natural order is powerless to destroy belief in the teachings of revelation, but can do much to confirm it, and as every newly discovered truth may serve to further the knowledge or the praise of God, it follows that whatsoever spreads the range of knowledge will always be willingly and even joyfully welcomed by the Church. She will always encourage and promote, as she does in other branches of knowledge, all study occupied with the investigation of nature. In these pursuits, should the human intellect discover anything not known before, the Church makes no opposition." In a subsequent encyclical titled *Providentissimus Deus* (1893), the same Pope affirms the impossibility of a real contradiction between Sacred Scripture and the natural sciences.

Following the common thread of the discussion that unfolded starting with the first contributions of the Magisterium which expressly addressed technological and scientific topics, we go through the stages of a discussion that is interesting and rich not only in terms of content but also because of the method in which it was carried out. If the many pontifical documents are analyzed specifically, we can see an apparent desire for real knowledge concerning the the different positions; something that is confirmed also by the personal interest of some Popes in the sciences, as it was the case of Pius XI (1922-1939) and Pius XII (1939-1958). Addressing the problems never remains superficial; on the contrary, it risks exploring specific questions; always with a critical spirit, aimed at pondering on every contribution without preconceived ideas and with the clear intention of leading every new understanding to the truth. The same critical approach, associated with the benevolent attitude that the Church always reserved for every authentic manifestation of human life and activity, has led to highlight scientific activity and appreciate it for the continuing cognitive accomplishments which have been reached. Declarations of esteem and praise for single individuals in science, indicated as examples to imitate, were not unusual.

2. The Relationship between Science and Faith in the Documents of Vatican II. In the constitution *Gaudium et spes*, Vatican II summarized the inspiring principles of a renewed presence of the Christian faithful in the world and outlined the general principles to guide the comparison and the dialogue with different contemporary cultural expressions. However, before going through the recommendations of this Council's document, it is useful to recall the cultural climate of those years, marked by the search for a new humanism and the appreciation for everything that demonstrated human greatness and dignity. This attitude is eloquently underscored by the final message addressed to men and women of science and culture on the occasion of the closing of the Council on December

8, 1965. Having at his side Jacques Maritain, Jean Guitton and Stefan Swiazawski as scholars and observers at the Council, Cardinal Paul Emilio Leger affirmed in this final message: "Continue your search without tiring and without ever despairing of the truth. [...] But do not forget that if thinking is something great, it is first a duty. Woe to him who voluntarily closes his eyes to the light. Thinking is also a responsibility, so woe to those who darken the spirit by the thousand tricks which degrade it, make it proud, deceive and deform it. What other basic principle is there for men of science except to think rightly?" (EV 1, 490-491)

In this regard, special attention must be given to the pastoral constitution *Gaudium et spes*. The reflection on science in this document begins with the evaluation of human intelligence and the passionate exercise of genius (n. 15), a source of progress and success throughout history. Progress which today is extended pervasively to every corner of the earth and raises continuous, urgent questions: What is the meaning and value of human activity? How are these activities to be used? To what end are individual and collective efforts aimed (n. 33)? The message of the Council on scientific and technological activity is at the heart of these questions and constructs a response aimed at the proclamation of the dignity of the human person. The activity of scientific research and the development of technology, like any other activity, are ordered to the human being: therefore, they intend not only to modify things but also to perfect the person; to fully realize his or her vocation (n. 35); and everything must be done according to God's design which corresponds to the true good of every individual and of all of mankind. Particularly, cultural activity, in all its changes, is seen as a necessary component of the process of personalization and a condition in order to be able to reach a level of life which is truly and fully human (n. 53).

Alongside this authoritative recognition of the value of human activity, *Gaudium et spes* ratifies the legitimate autonomy of culture and especially of the sciences, after having warned about the interpretation of the term autonomy as a synonym of non-dependence of created realities on their Creator and as a tacit authorization to manipulate things beyond any transcendental reference: "When God is forgotten, however, the creature itself grows unintelligible" (n. 36). Walking along this road requires the rigorous respect for the methodological statute of every discipline; which implies continuous research and the exploration of specific quality of every form of knowledge. On the one hand, the Vatican Council addresses the desire of contemporary man to recognize the value of so many efforts and appreciate every single advancement, albeit small, achieved in a specific field as a part of the greater, unlimited truth. On the other hand, the Council fathers do not underestimate the dominant phenomenon of what Roman Guardini (1885-1968) called "the modern age," which consisted in a progressive break from the medieval thought and the process of the growing fragmentation of culture (cf. R. Guardini, *The End of the Modern World*, Wilmington, DE: Intercollegiate Studies Institute, 1951); these events did not prevent a clear analysis (cf. n. 56) of the limits and contradictions in which human culture is developed today.

At the same time, the reflection of *Gaudium et spes* embraces the epistemological elaborations of the 19th century which focused on the plurality of methods of research which are connected to the plurality of the objects of knowledge. Therefore, the document addresses a pressing invitation to distinguish the orders of knowledge and clarify the employment of different methods of research in the respective fields of competence (cf. n. 59). It is a reconfirmation, enriched with the experience of almost a century, stated by the First Vatican Council, according to which "the Church does not forbid disciplines of this kind, each in its own sphere, to use its own principles and its own method" (DH 3019). Finally, a vivid appeal to the moral responsibility of researchers and technicians, especially that of believers (cf. n. 62), closes a document that one of its writers, Bishop Karol Wojtyla of Krakow, would define thirty years later as a sort of "magna charta" of human dignity to be defended and promoted.

The theme of the moral responsibility of scientists and technicians is also addressed in two other of the Council's documents. The Decree on the media *Inter mirifica* invites us to use these instruments while keeping in mind the content, that must be communicated according to the nature of each instrument and considering all circumstances —ends, persons, place, time, etc.— in which the

communication will take place and which are capable of modifying the message, or even changing completely its moral value (n. 4). Here we find the principle that the moral order invests the totality of the human being, and therefore it overcomes and must harmonize all the order orders of human life (n. 6).

The Decree on the apostolate of lay people, *Apostolicam actuositatem*, speaking of the use of temporal realities by the Christian faithful, points out that frequently such a use does not follow the principles of moral law. Then it warns that "in our own time, moreover, those who have trusted excessively in the progress of the natural sciences and the technical arts have fallen into an idolatry of temporal things and have become their slaves rather than their masters" (n. 7).

III. The Most Important Topics underlined by the Catholic Magisterium concerning Scientific Thought.

1. *The Appraisal of a Realistic Approach to Knowledge: Encountering Reality.* Many reflections made by the Magisterium begin by emphasizing that it is the surprise, full of stupor and wonder, for the beauty and the magnificence of the universe in which we live, which stimulates the pursuit of knowledge in the researcher's experience, and which gives it the fascination of a truly human adventure. In effect, the majority of scientists testify that all research is sustained by an attitude of wonder that accompanies the researcher in all fields in which questions continue to be asked: from the dominion of the infinitely great, the macrocosmos of galaxies, stars and planets; to the infinitely small, that inanimate and lively microcosmos that contemporary electronic microscopes allow us to penetrate and visualize with growing precision. Yet one feels wonder also before the marvelous spectacle that nature offers us daily, in its most accessible dimension, and which strikes common people as well as anyone who works in the field of natural sciences.

However, the relationship of the human being with the universe cannot be limited to a purely aesthetic response. The encounter with reality inevitably arouses the conscience, and triggers the desire for a fuller relationship, provokes the curiosity of reason, which at the same time discovers itself able to understand what appeals its interest. By means of our rational thought we try to understand and explain various natural phenomena, and attempt to formulate theories in which single explanations find an ordered and rigorous place: it is the objective of science that has mobilized the most noble genius since antiquity, experimenting a continuous progress of methods, languages and instruments. Through scientific knowledge, we are able to build a series of relationships, most of which are expressed in a mathematical form, that links together the many objects and parts of the universe, in its present configuration or along its historical evolution.

This capacity of comprehension is surprising by itself and, in a certain sense, incomprehensible. «The wonder is not that the material, visible universe is as big, as immense, as science has revealed, sweeping the intelligence of scholars in abysses full of endless mysteries: the wonder is that we embrace all of this in a thought, we express it in one word: universe. And many have contributed to this knowledge: humble people in a somewhat unconscious way, and great minds such as St. Augustine , St. Thomas , Galileo and Newton . All of this in one word: universe» (Pius XI, *Discourse to the High Institute of Religious Culture*, Rome, June 17, 1928, in "Discorsi di Pio XI," Turin: S.E.I., 1959, **1960, 1961** and anastatic reprint Vatican City: Libreria Editrice Vaticana, 1985, vol. I, p. 799).

In such an effort of reflection and deeper understanding, two considerations must be made, among others; they are considerations which are already very present in the wisdom of the ancients, but that the pragmatic, contemporary, utilitarian mentality, often does not know how, or does not want to appreciate. The first is the perception of reality as something that "exists," something which is present before our eyes, which precedes us, something "other than us," which surprises us, as if it were a free gift. Pope Paul VI repeatedly recalled this idea in various speeches, during the years in which the great discoveries of astrophysics and the startling endeavors of astronautics advanced at an equal pace (cf.

The Creed of the People of God, June 30, 1968, EV 3, 541; *General Audience* July 16, 1969, *Insegnamenti*, VII (1969), pp. 495-496; *Discourse to the Participants to the Study Week on "Nuclei of Galaxies,"* April 18, 1970, *Insegnamenti*, VIII (1969), pp. 326-333). The second consideration could be summarized by the title of Kepler's work *Harmonices Mundi* (1691): the universe not only stands in front of us, but it also reveals an objective degree of harmony, a wonderful order that governs and connects all the parts of this limitless reality and that the scientist, perhaps more than others, can advise about or try to represent.

The perception of "being" as alterity, as gratuitousness, and the sense of order which permeates the entire universe, are two dimensions that play a decisive role in the scientist's experience, even if this role is only implicitly recognized, and often underestimated. These dimensions represent a presupposition for scientific research and a natural starting point for its work: would it make any sense to research the laws of a vanishing and totally chaotic universe, whose existence and structure were attached to the weak thread of our reasoning and whose functioning could not be in some way understood? The presupposition of the objective "being" and the overall order of the whole of reality becomes a permanent condition to do research; at least insofar as research is not understood as the mere projection of our theoretical models over things, almost wanting to bridle natural phenomena in the cages of our equations, but, instead, as listening and observing what nature itself communicates to us. The well-known image used by Galileo in his work *The Assayer* (1622), "Philosophy is written in this great book which is continually open before our eyes (I mean the Universe)...," echoes in many speeches of Pius XII to the Pontifical Academy of Sciences: "Is the universe perhaps dumb when it presents itself to you? Does not it have something to tell you so as to satisfy the powerful inclinations of your intellects for a grand synthesis of the sciences? For a synthesis which is in accord with the order of the universe?" (*Address to the Pontifical Academy of Sciences*, November 30, 1941, *Papal Addresses*, 2003, p. 96). It is a stupor and an observation that does not despise the use of the more refined mathematical and logical models in the depth of the cosmic ocean, ready to be substituted by more effective instruments if reality requires it.

The experience of encountering nature through science resonates within the spirit of those researchers capable of maintaining openness and sensitivity, and simultaneously generates feelings of enthusiasm and humility. This humility is not just the recognition of the limits of human beings, and therefore of scientific research itself, but concerns a broader view of reality and gives rise, as occurred in many scientists, to a dimension of "cosmic religiosity," of which Einstein spoke in such an emblematic way.

2. Human Capacity to tend towards the Truth. In the closing message of Vatican Council II, a special appeal was addressed to men and women of thought and science: "A very special greeting to you, seekers after truth, to you, men of thought and science, the explorers of man, of the universe and of history, to all of you who are pilgrims en route to the light and to those also who have stopped along the road, tired and disappointed by their vain search. [...] Hence for you also we have a message and it is this: Continue your search without tiring and without ever despairing of the truth. Recall the words of one of your great friends, St. Augustine: 'Let us seek with the desire to find, and find with the desire to seek still more.' Happy are those who, while possessing the truth, search more earnestly for it in order to renew it, deepen it and transmit it to others" (EV 1, 487-490). These words thoughtfully but clearly define the motivation and the objective of all scientific knowledge which, like that of any other form of knowledge, is the striving after **truth**. This is a universal motivation, one that may be traced back to the beginnings of modern science. The desire for truth, and the need for a growing correlation between our knowledge of things and the reality of the things themselves, have played a fundamental role in the long and tiring journey that has led to the construction of experimental methodology, which Galileo himself conceived as being the most suitable way to understand the behavior of natural phenomena.

The history of science, as part of the overall trajectory experimented by Western culture during the last three centuries, has often thrown into the shade the driving force of that original motive, if not openly contradicted it. Actually, the debate on truth remains open in contemporary epistemology.

However, if we approach more directly the experience of scientists, we may still encounter that striving after truth, like a well sprinkling from the depths, which nourishes their intellectual enterprises and supplies the energy necessary for an often tiring, not always equally stimulating, task.

Nonetheless, the history of science has shown how the intention to reach the truth may become attenuated, even to the point that it disappears altogether and leaves the way open to other objectives and other motivations. Hence the need to specify certain conditions that make it possible for the initial ideal to be upheld during the entire course of research. John Paul II indicated the first of these *conditions* during his address in Cologne, Germany, on November 15, 1980, feast of St. Albert the Great: it is the conviction that truth *can* be known, that the human beings *do* have this possibility, even though, as the Pope notes, we can only understand "fragments of truth." What the intellect grasps are "partial ways of knowledge," limited and circumscribed, but *truths* nonetheless—despite all nihilist and skeptical tendencies. "Science—John Paul II added on that same occasion—has a meaning of its own and a justification when it is recognized as being capable of knowing the truth."

The second condition complements the first. Precisely because our knowledge attains a partial truth, human knowledge must be recognized as part of a broader, global Truth, one that is not the product of human creation, one that can be received only by divine Revelation: "To assist reason in its effort to understand the mystery there are the signs which Revelation itself presents. These serve to lead the search for truth to new depths, enabling the mind in its autonomous exploration to penetrate within the mystery" (*Fides et ratio*, n. 13).

A third condition also exists, one that follows from the recognition of truth as a "human good": the freedom of research. Research must be free from all forms of ideological conditioning, as well as from any form of power. "Basic research must be free with regard to the political and economic authorities, which must cooperate in its development, without hampering it in its creativity or harnessing it to serve their own purposes. Like any other truth, scientific truth is, in fact, answerable only to itself and to the supreme truth, God, the creator of man and of all things" (John Paul II, *Discourse to the Pontifical Academy of Sciences, November 10, 1979*, in *Papal Addresses*, 2003, p. 240).

3. Criticisms of Ideological Reductionism. The stimulating view that sees science as one of the ways to truth must be constantly rediscovered at a personal level; just as it must be supported by the correct cultural context. Otherwise, the way is left open to the dangerous trap of ideologies: "If widespread confidence in science is disappointed, then the state of mind easily changes into hostility to science. In this space that has remained empty, ideologies suddenly break in. They sometimes behave as if they were 'scientific' but they owe their power of persuasion to the urgent need for an answer to the question of meanings and to the interest in social and political change. Science that is purely functional, without values and alienated from truth, can enter the service of these ideologies" (John Paul II, *Meeting with Scientists and Students in Cologne Cathedral*, November 15, 1980, n. 3).

In the course of its history, science has undergone all manner of ideological subjection, and continually risks becoming either advocate or victim of various forms of reductionism. Ideology threatens science when it restricts the field of knowledge to only that which can be subject of scientific research; when it reduces the sphere of reason to scientific reason alone; and when, rendering scientific methodology absolute, it leads to a sense of self-sufficiency and makes human beings incapable of recognizing anything that concerns their spiritual essence (cf. *Gaudium et spes*, n. 57). Today, the most disturbing ideological aspect that threatens science, and culture in general, is the tendency to interpret everything in utilitarian, pragmatic and functional terms: "Our culture, in all its areas, is imbued with a science which proceeds in a way that is largely functionalistic" (John Paul II, *Meeting with Scientists and Students in Cologne Cathedral*, November 15, 1980, n. 3). Such reduction itself acts as a brake on scientific progress, and as a cause of crisis in contemporary humankind, which oscillates dramatically between two opposing positions: from boundless faith in the possibilities of science and technology, to terrible misgivings concerning the destructive effects of many discoveries and innovations. The frequently disproportionate hopes placed on the work of scientists, are accompanied by diffidence and

fear for the uncontrollable results of an activity that seems to have lost its most profound finality and meaning.

The Church's Magisterium has repeatedly reminded humanity of these dangers, and identified the roots of the problem in the desire to dominate and the lack of awareness of the limits of human activity. Pope Pius XII in particular, who witnessed a period of science and technology marked by both triumph and tragedy, repeatedly analyzed the phenomenon, especially highlighting the consequences of an uncritical adopting of a mentality shaped by the "technological spirit" and revealing the fundamental error in such a vision of the world: "The panorama, at first sight apparently limitless, which technology opens before the eyes of contemporary man, however vast it may be, nonetheless remains a partial projection of life on reality, expressing the latter's relationship to matter only. It is, then, an illusory panorama; one that ends up enclosing man, over-credulous in the immensity and omnipotence of technology, in a prison. The prison is huge but limited and, therefore, in the long run, unbearable to his true spirit" (December 25, 1953, *Discorsi e radiomessaggi*, vol. XIV, pp. 522-523).

The Church's repeated warnings on this matter should not, however, be considered as an undervaluation of technology, nor at all as a desire for some impossible return to a pre-technological age. Rather, they represent a call to vigilance concerning certain forms of technical-scientific practice and the repercussions they have on the mentality and attitudes of contemporary humanity. There is also the invitation to maintain a clear distinction, at least as regards their final objectives, between basic science and technology —with the aim of rebuilding the image of a science that maintains all its most genuine values intact.

4. The Priority of Ethics over Technology . Questions inevitably arise when we come to examine the consequences of scientific discoveries, particularly the practical applications of technology, which are extending their influence into all of our lives, and to which the contemporary science have given fresh impulse. These questions concern the significance of and conditions for "true" human [progress](#). They are, actually, the same questions posed by Pope Paul VI during one of the culminating and most symbolic moments in human technological-scientific journey, the historical night of the Moon landing: "Today is a great day, a historical day for mankind if this evening two men truly manage to step onto the Moon. [...] We would do well to meditate upon this extraordinary and marvelous event. [...] We would do well to meditate upon man, upon his prodigious genius, upon his audacious courage, upon the fantastic progress he has made. [...] Who is man? Who are we that are capable of so much? We would do well to meditate upon progress. [...] Our admiration, enthusiasm and passion for technology —for the products of man's hand and genius— hold us in thrall, perhaps to the point of madness. Here lies the danger: we must be on our guard against the potential idolatry of technology. It is true that technology multiplies man's effectiveness beyond all limits, but is such effectiveness always an advantage? Does it make man better? Healthier? Or could technology imprison the man that produces it, making him slave to the way of life that technology's production and use imposes on its possessor?" (*Speech at the Angelus*, July 20, 1969, *Insegnamenti*, VII [1969], p. 497).

The more [technology](#) advances and spreads, the more it demonstrates its potential, both to serve human beings and to turn against them. In other words, it demonstrates its ambivalent character, its non-neutrality. "Technological development, characteristic of our time, is suffering from a fundamental ambivalence; while on the one hand it enables man to take in hand his own destiny, it exposes him, on the other hand, to the temptation of going beyond the limits of a reasonable dominion over nature, jeopardizing the very survival and integrity of the human person" (John Paul II, *Discourse to participants in two Conference of Medicine and Surgery*, October 27, 1980, ORWE November 17, 1980, p. 19).

As we said earlier, the Magisterium of the Church has never adopted an aprioristic anti-scientific or anti-technological standpoint, though during various moments of crisis such an attitude has repeatedly emerged as a reaction, at least in some fields of human culture. The Church has taken up a strongly realistic position, typical of one passionately concerned with real men and women, whose experience

Christ wished to share even down to the simple everyday details. On the basis of this position, science and technology have always been considered as being fine opportunities in themselves, tools to build the earthly city that is not, however, an alternative to the heavenly city. Indeed, precisely because of her realism —as an "expert in humanity", to use the expression of Paul VI — the Church does not forget that science and technology are placed in the hands of human beings strongly marked by their limitations (original sin), and by their incapacity to act in full coherence with goals that they, nonetheless, judge to be good. The problem, then, is not one of taking up a position for or against technical and scientific progress, but of giving deep consideration to the question of the human person, and to the criteria that must guide his and her actions.

There is only one real and pressing imperative of our time, that explicitly and profoundly concerns humanity, that is the moral imperative. Pope Paul VI provided a clear analysis of such an imperative in his Letter *Octogesima adveniens* (May 14, 1971), identifying the true progress with the development of human moral conscience. However, it was John Paul II who rendered this imperative a proposal and a challenge for all men and women at the end of the second millennium. The awakening of the moral dimension truly seems to be a sign of the times and, consequently, it must be the subject of effective and capillary education at all levels of social life. The priority of ethics over technology is strongly emphasized in the Encyclical *Redemptor hominis*: "The essential meaning of that 'kingship' and 'dominion' over the visible world, which the Creator himself gave man for his task, consists in the priority of ethics over technology, in the primacy of the person over things, and in the superiority of spirit over matter" (n. 16). This has become the pivot of a new alliance proposed by John Paul II on two decisive occasions, in Paris at the UNESCO in June 1980, and at Hiroshima in February 1981, in which his words were not addressed just to believers: it is the alliance of science and conscience, because the cause of humanity is better served if science allies itself to conscience.

Science, then, is not the highest value to which all other values are subordinate; it must always be sustained and guided by the moral imperative. Yet, what concise criterion may be used to orient daily practice and make such a proposal feasible? The criterion is the dignity of the person, considered in all of his or her dimensions; and all research programs, single projects or investigative methods must be weighed and considered on this basis. There is no space for neutrality in any human activity, not even in the name of science is it permissible to invoke a suspension of moral judgment. Each human action adopts a stance, in some way, either for or against the human person. The person must be the measure and the criterion for the goodness or wickedness of each human expression and activity. This concept must be seriously investigated, leaving no aspect overlooked and without merely reducing the person to certain needs and appearances. The lack of such impartial debate is precisely what is lacking, for example, from so many debates in the field of [bioethics](#) or in [environmentalist campaigns](#).

We can understand, then, the profound significance of an affirmation clearly and frequently expressed by the Magisterium: technology must be "at the service of man and humanity." Sociologists and politicians often use this same phrase, to the point that it has almost become a slogan. Yet frequently repeated —often reductively and superficially— it risks losing its impact and importance, one which can only be fully appreciated from a personalistic perspective.

All the above affirmations, in order not to remain just principles and good intentions, must be translated into concrete decisions, with the establishing of priorities in political, economic and social decisions. Such priorities must favor the intelligent utilization of scientific and technical resources, and avoid reproducing or increasing the imbalances and injustices that still weigh heavily on many peoples. The appeal to "re-define priorities" was one of the culminating moments in John Paul II's speech at Hiroshima on February, 25, 1981.

5. Beyond Conflicts. The Opportunity for Fruitful Dialogue between the Church and Science . Despite the numerous and profitable interchanges between the Church's historical path and the progress of science and technology, the image of two conflicts has always prevailed in public opinion (and in the

works of the *maîtres à penser* who, more or less explicitly, guide public opinion), presenting themselves as a burdensome heritage not only for the Catholic Church, but for the relation between Religion and Science in general: they are the two historical controversies of the "Galileo affair" and of the question of evolutionism. However, it would be reductive to think that these two historical cases prevented any possibility of further dialogue. Yet the concrete possibility of a fruitful encounter between the religious dimension and scientific research is well documented: not just through the experiences of so many scientists or technicians who are believers; nor simply, as has already been observed, through numerous texts of the Church's Magisterium from the end of the 19th century onwards; but also, at least as concerns the Catholic Church, in institutions created with the specific aim of conducting such a dialogue. Apart from the foundations of Catholic Universities and the research activities carried out by members of many of the Church's Institutions, two Organizations of international importance bear witness to the Church's interest in science, namely the [Pontifical Academy of Sciences](#) and the Vatican Observatory.

The former of these two Institutes, founded by Pope Pius XI in 1936 with the motu proprio *In multis solaciis*, has its historical roots in the Accademia dei Lincei, which was founded by Federico Cesi in 1603 and counted Galileo as one its first members. The aim of the Pontifical Academy of Sciences is to contribute, through scientific knowledge, to the search for truth, without preclusion or prejudice of any kind. It has included among its members —and continues to include— the most important names in 20th-century science (among them many Nobel Prize winners), and carries out its activities through meetings, seminars, workgroups and study weeks, both on subjects concerning basic science and on the principal problems associated with practical applications of technology and their social impact. The Vatican Observatory links to the Church's centuries-long activity in the field of astronomy, of which documentary records date back to 1579 when Pope Gregory XIII (1575-1585) founded the first Pontifical Observatory, revitalized in modern times with the creation of the *Specola* by Pope Leo XIII with his motu proprio *Ut mysticam* (March 14, 1891). The Vatican Observatory operates at Castelgandolfo and Tucson, Arizona. Thanks to the Vatican Advanced Technology Telescope (VATT) built on Mt Graham, Arizona, its staff is able to undertake astronomical research programs in collaboration with other international groups and institutions, as already occurred using the Castelgandolfo telescopes during the first half of 20th century.

Nonetheless, it was only on the eve of Vatican II that the ending point of the conflict between science and religion began to become perceptible. And it was around the beginning of the 1980s when a new season of mutual cooperation was finally established. What Pope John XXIII expressed with the language of hope —"we have entered, thank God, upon an epoch when, let us hope, questions about opposition between the conquests of the human mind and the demands of faith will become less frequent" (John XXIII, *Discourse to the Pontifical Academy of Sciences*, October 5, 1962, in *Papal Addresses*, 2003, p. 169) — was greeted by John Paul II as something in the process of being accomplished: "The issue today is no longer that of opposition between science and faith. A new period has begun: the efforts of scientists and theologians must now be directed to developing a constructive dialogue, making it possible to examine more and more deeply the fascinating mystery of man and also to foil the threats to man that are unfortunately growing daily more grave» (John Paul II, *Discourse to a Group of Nobel Prize Winners*, December 22, 1980, *Insegnamenti*, III, 2 (1980), p. 1784). It is not just a question of formal dialogue or of mutual tolerance, but of discovering that, even at the epoch of the Galileo affair, "agreements between religion and science were more numerous and above all more important than the incomprehensions which led to the bitter and painful conflict that continued in the course of the following centuries" ([John Paul II, Discourse to the Pontifical Academy of Sciences, November 10, 1979](#), in *Papal Addresses*, 2003, p. 242).

What Christianity proposes is a long way from being an invitation to take no interest in contemporary reality and seek refuge in some aseptic spiritual dimension. Thus, any contribution that helps towards a better understanding of reality, at all levels, can only be included within the religious experience as a further revelation of the richness and depth of the real world, and of the amazing faculty the human person has to decipher the language of things. Technical advancement is also part of this open and

humanizing context. When developed in a purely secularized context, science and technology can come to impede the encounter with God; whereas, when they are carried out within an environment of openness and transcendence, they can facilitate that encounter "with the stimulus of the discovery of nature's existential depths, and the experience of human intellect which does not invent those depths but uncovers and utilizes them. It is a matter of keeping our eyes open, in other words of using our intelligence as it can and must be used, of looking behind the barrier of the senses and seeking out the essential and final causes of things" (Paul VI, *General Audience*, June 12, 1968, *Insegnamenti*, VI (1968), p. 820). In this way science and technology can also favor the growth of an attitude of dependence on reality —and therefore a religious attitude— educating people to humility "for science is not pride; it leads there to only if deflected from its purpose. It is a lesson in humility: only by obeying nature it is possible to conquer it" (Paul VI, *Discourse to the Pontifical Academy of Sciences*, April 15, 1972, in *Papal Addresses*, 2003, p. 203).

A need is clearly emerging from within the world of science for a broadening of the cognitive horizon, for a confrontation with other kinds of knowledge, other ways of approaching reality. This is not a cry for help arising from the awareness of the limits in scientific knowledge or in the potential of certain forms of technology; it may yet be a passing phenomenon, one destined to disappear in the face of unforeseeable future developments of research. The questions that surge forth today from all the scientific disciplines go much deeper. It urgently calls for a [reconstruction of knowledge](#). In this task, all forms of knowledge must make their best contribution, with no privileges and with a sincere desire for dialogue. Scientists, then, have a serious interest in relating their knowledge to a well-founded philosophy that does not abdicate the search for truth, and, in the same way, to a religious faith respectful of reason, understood as the maximum expression of human thought in the face of the mystery.

6. *The Presence of Christian Faithful in the World of Technology and Science.* The teachings here outlined are nothing but a call to scientists, first and foremost to scientists who are also believers, to take on their responsibility. Faithful to their pastoral mission towards the Christian community, the Roman Pontiffs have not limited themselves to laying down theoretical guidelines for the scientific debate, but have directly and repeatedly called the faithful involved in scientific and technological activities to behave in accord with their own faith. Pope John XXIII did so in a particularly decisive way: "we consider it indispensable today that large numbers of committed Catholics be present in this field, in order to orient it, with great human zeal, in the direction wished for by the Creator" (*Discourse to Members of the International Committee for Catholic Theology*, December 30, 1959) —thus anticipating the concerns later highlighted in his Encyclical *Pacem in terris* (April 11, 1963): "It is no less clear that today, in traditionally Christian nations, secular institutions, although demonstrating a high degree of scientific and technical perfection, and efficiency in achieving their respective ends, not infrequently are but slightly affected by Christian motivation or inspiration" (n. 151).

Thus the presence of Christian faithful in the world of science is not merely accidental, but it implies to a specific role. The Magisterium of the Church first recommends the primacy of conscience, especially in the face of the serious questions weighing on the future of humanity. This invitation pervaded the teaching of all the Popes during the troubled 20th century. It became even more pressing during the period of the Cold War before the specter of a possible nuclear conflict; in the subsequent years with respect to the need of taking care of the [environment](#), and finally because of the uncontrolled development of biomedical technology that motivated fear of reckless experiments capable of damaging the integrity and dignity of the human person. In the mid 1970s, Paul VI indicated some of the duties of the Christian scientist: "On the one hand, he must honestly consider the question of the earthly future of mankind and, as a responsible person, help to prepare it, to preserve it, and eliminate risks; we think that this solidarity with future generations is a form of charity to which a great many men are sensitive today, in the framework of ecology» (*Discourse to the Pontifical Academy of Sciences*, April 19, 1975, in *Papal Addresses*, 2003, p. 209). For his part, Pope John Paul II has promoted a general mobilization of all men and women of good will in the conviction that current generations, living at the turn of a new millennium, find themselves facing a great moral challenge,

which consists in harmonizing the values of science and the values of conscience (cf. *The Responsibilities of Science and Technology*, Hiroshima, February 25, 1981, ORWE March 9, 1981, pp. 15-17). The second invitation the Magisterium makes is to bear witness to the possibility of a fruitful integration between science and wisdom. This is one of the most heartfelt appeals of Vatican II: "Our era needs such wisdom more than bygone ages if the discoveries made by man are to be further humanized. For the future of the world stands in peril unless wiser men are forthcoming" (*Gaudium et spes*, n. 15); and it recurs repeatedly in John Paul II's addresses on issues related to science and its technological applications.

Further confirmation of the importance that the Magisterium gives to the presence of Christians in the field of science and technology may be found in the numerous references to the life and work of famous scientists who were also believers, on the occasion of anniversaries, celebrations or conferences on specific themes. The first important pronouncement was that made by Pope Pius XI in 1931, when he solemnly proclaimed Albert the Great as Saint and Doctor of the Church. Ten years later, Pope Pius XII added to those titles that of "celestial patron of scholars of the natural sciences". On the seven hundredth anniversary of St Albert's death in the city of which he was "bishop and mediator of peace," John Paul II highlights St. Albert's principal virtues: "courage, which defends science in a world marked by doubts, alienated from truth, and in need of meaning; and humility, through which we recognize the finiteness of reason before Truth which transcends it" ([John Paul II, Meeting with Scientists and Students in Cologne Cathedral](#), November 15, 1980, n. 5).

At different times, Pope Pius XII concerned himself with other figures such as Alessandro Volta (January 19, 1933), Louis Pasteur (March 28, 1936) and Guglielmo Marconi (October 3, 1947). As for the work of Copernicus, "who was able to bring faith and science together in a fruitful and admirable union," Paul VI dedicated an entire letter to him, a letter sent to the primate of Poland, Cardinal Wyszyński, on January 23, 1973 for the fifth centenary of the birth of the great astronomer (cf. *Coeli enarrant gloriam Dei*, in *Insegnamenti*, XI (1973), pp. 61-63). In this context, the beatification of two men of science assumes a particular significance: Giuseppe Moscati and Niels Steensen. Speaking of the former, a doctor and professor at the University of Naples in the early decades of the 20th century, Paul VI highlighted his human and professional qualities, his tireless devotion to his patients, his charity and the strength of his faith, «which guided his researches and illuminated his cures» (November 16, 1975). The latter, a Danish naturalist of the 17th century, was praised by John Paul II in his homily of beatification (October 23, 1988) for the spirit with which he undertook his research, a spirit unsatisfied by mere hypotheses but ever tending towards the search for the ultimate causes.

IV. The Contribution of the Pontificate of John Paul II

1. The Magisterium of John Paul II and its Sensitivity to the Dialogue between Faith and Science. Before examining the novelties introduced into the debate by John Paul II, we must first consider the quantity and public relevance of the contributions he makes on an almost annual basis to the Pontifical Academy of Sciences, as well as frequently in the course of his principal visits and travels, in audiences before the academic world or on other special occasions. In certain circumstances his involvement has taken on an extraordinary historical importance, such as in the decision to reconsider the case of Galileo, with all the consequences that ensued. In order to identify the themes that recur in John Paul II's teaching, we must first consider the basic cultural make-up of his pontificate as it clearly emerges in his encyclicals, beginning with the most recent *Fides et ratio* (September 14, 1998) which explicitly deals with a theme—the relationship between faith and science— touched upon in all his other writings.

In *Fides et ratio*, John Paul II deals with the "drama of the separation of faith and reason" (cf. nn. 45-48), already visible at the end of the Middle Ages and subsequently developed through rationalism and the Enlightenment, as well as with the main consequence thereof: a substantial mistrust of reason's capability to attain the truth. Yet faith has nothing to gain from a weak reason, such as that which manifests itself in most of the philosophy at the close of the millennium. Quite the contrary, a

weak conception of reason does nothing but favor the progressive slide into [fideism](#), in which faith is seen as only an attitude of the heart; a kind of ethical inspiration, and not as a full expression of reason illuminated by Grace. This temptation is widespread among contemporary scientists, more unwilling than they once were to openly profess [atheism](#), but still shackled to an absolutist image of scientific reason as being the only complete form of rationality.

Associated with this theme is that of the affirmation of the primacy of truth, and the declaration of obedience to truth as a fundamental regulatory criterion, not only of all intellectual activity but also of all human actions. John Paul II dedicated an entire encyclical to this subject, *Veritatis splendor* (August 6, 1993). It deals principally with the problem of the foundations of Christian morality, yet the entire reflection revolves around the theme of "passion for truth" as the driving force behind all knowledge-seeking enterprises, and of "openness to truth" as a condition for effective knowledge. A view, then, quite far from so many contemporary philosophical programs which, in censuring the notion of truth, remain trapped in an unproductive and humanly deceptive solipsism.

An insistence on the search for truth also constitutes a basic condition for an effective dialogue between faith and science. Such dialogue finds its most fertile ground precisely in sharing the quest for truth, in the sincere desire to accept and respect the truth as it is discovered, to love the truth itself more than one's own ideas about the truth. "The intellectual who thinks about the meaning of his mission understands that the soul of that mission is the love of truth above everything. His fundamental attitude cannot be other than seeking and welcoming what is true. Much strength of soul, a large degree of inner freedom and of independence are necessary in regard to the dominant mentalities and fashions, as well as much loyalty and humility. But, at the end of their arduous quests, the greatest joy of intellectuals is the *gaudium de veritate* of which St Augustine spoke with enthusiasm" (John Paul II, *Discourse to the World of Culture at Fribourg University*, June 13, 1984, ORWE July 2, 1984, p. 3). Passion for truth cannot be separated from passion for the human being, and this combination gives rise to a passion for the truth about the human person. This involves constant attention to every human person in his or her full integrity, this includes all dimensions of human life, a respect for the dramatic depth of our existential questions and for our inextinguishable need for meaning and significance.

This special emphasis on the anthropological perspective is particularly evident when considering the technical applications of the sciences. We deal here with a fully philosophical perspective, far from any simple moralistic exhortation. When John Paul II appeals to the moral responsibility of the men and women of science, he does not make his call a simple question of "correct" behavior; rather, he poses the question at a more radical level. In order to lead the debate on technology out of the shoals of moralism, it is necessary to intervene at the level of the genesis and objectives of technology, even before analyzing its processes. In doing so, at both extremes, that is at the beginning and at the end of every activity, we find the human being in his or her dual role, that is, as the subject and object of technical activity. This is one of John Paul II's most forceful philosophical traits. It characterizes particularly his Encyclical *Laborem exercens* (September 14, 1981): "The sources of dignity of work are to be sought primarily in the subjective dimension, not in the objective one" (n. 6); human work, "it is not only good in the sense that it is useful or something to enjoy; it is also good as being something worthy; that is to say, something that corresponds to man's dignity, that express this dignity and increases it" (n. 9).

John Paul II's view on human activity and its moral dimension are included and highlighted in the Christocentric perspective of the Encyclical *Redemptor hominis*, the blueprint of the entire pontificate. [Jesus Christ](#), center of the cosmos and of history, is the truth of the human being and, therefore, of all his and her expressions, science and technology included. Only in Christ the Redeemer one can break the perennial temptation to self-sufficiency and open oneself up to reality in total freedom. The fundamental conditions for true knowledge are thus realized: the scientific and technological quest, preserved by the temptation of omnipotence and self-reliance, and made free to bind itself to truth only, finally takes on its true proportions.

John Paul II's contribution to the themes we have so far considered has two original elements deriving from his own specific cultural formation and the historical period in which he has lived, that gave him a privileged viewpoint to evaluate the situation of contemporary society. The first one is the novelty of an approach especially based on [experience](#). Alberto Strumia (1987) makes a good analysis certain texts in which Wojtyła the philosopher developed the method of the phenomenological analysis of experience, and identifies the same elements in John Paul II's analysis of scientific experience. Strumia notes how this method applies particularly well to modern science, which seeks to construct theories on the basis, and as an explanation of experience. He observes how Wojtyła managed to develop a philosophy of experience which does not oppose, but descriptively integrates classic metaphysics and epistemology. The second element evident in the writings of John Paul II is his clear analysis of the crisis of contemporary man (and, therefore, of modern science), effectively summed up in the word "fear". He immediately indicated as much in *Redemptor hominis*, and has repeatedly returned to the theme in order to describe the profound unease of a man who fears what he produces, the very products that contain a special portion of his own genius and initiative. This is the drama of our time, to which technical and scientific advances contribute in a critical way. The fear first took the form of the nuclear threat, then of ecological disaster, then of the totalitarianism of computer technology and then, above all, of the manipulation of that inviolable nucleus of the human being which is our genetic heritage. The realism of John Paul II's analysis makes his perspective even more convincing.

2. A Number of Particularly Important Contributions . A number of fundamental texts that represent milestones on the road to a renewed dialogue between the Catholic Church and the world of science deserve to be here mentioned.

Among the many themes covered by the discourse delivered in Cologne Cathedral in 1980, particular consideration must be given to the passage that identifies the heart of the contemporary crisis: it is the tension between the functionalist, reductive view of scientific knowledge, and the unsatisfied need for a meaning: "There is talk of crisis of legitimization of science, nay more, of a crisis of orientation of our whole scientific culture. What is its essence? Science alone is not able to give a complete answer to the question of meanings, which is raised in the crisis. [...] Science alone is not capable of answering the question of meanings, in fact it cannot even set it in the framework of its starting point. And yet this question of meanings cannot tolerate indefinite postponement of its answer» ([Meeting with Scientists and Students in Cologne Cathedral](#), November 15, 1980, n. 3).

Speaking to university Faculty members at Bologna, on April 18, 1982, the Pope returned to the theme of the plurality of methods of knowledge, making reference to a "dialogic and dynamic" truth, and to a form of reason that grasps the unity of reality "within partial modes of knowledge», that is, within «a system of open and complementary areas of knowledge." He invoked freedom as an essential condition for the development of learning because "learning can more effectively influence practice according to how truly free it is," and indicated that such a commitment requires the creation of true communities of research "where men who love knowledge learn to respect each other, to consult each other, creating a cultural and human climate which is as far removed from closed and exaggerated specialization as it is from lack of precision and relativism."

Places of this kind can be created in universities, but also in other structures. For example in a big laboratory of the physical sciences such as CERN in Geneva, where John Paul II highlighted how the study of the infinitely small concerns all researchers in as much as it contributes to unveiling "part of that mystery which is the human being too." He also took that occasion to indicate some of the as yet unfaced questions concerning the nature of the universe, and the most fundamental queries arising beyond the confines of the natural sciences, and drew everything back to the human person, whose investigative power is so great, and who feels so small in the face of scientific discoveries. Finally, he addressed the scientists personally, observing that "as men you cannot help but ask yourselves the other fundamental existential questions about which I spoke, which are answered by philosophical

wisdom and faith" (*Discourse at the CERN International Research Center in Geneva, June 15, 1982*, ORWE July 26, 1982, p. 7).

Concerning the theme of moral responsibility, John Paul II appeals directly to the consciences and the sense of responsibility of individual scientists, who are called to pursue the ethical renewal indispensable for constructing a society worthy of the human person. "This is a responsibility that falls upon you," he told a group of Nobel Prize winners received in audience in the Vatican on December 22, 1980. To scientists of the United Nations University in Hiroshima he made this vibrant appeal: "Men and women dedicated to research and culture: your work has taken on a completely new importance in this age marked by the rise of science and technology. [...] I urge all scientists, centers of research and universities to study more deeply the ethical problems of this technological society" (*The Responsibilities of Science and Technology*, Hiroshima February 25, 1981, ORWE March 9, 1981, p. 16). In a discourse delivered at Madrid's Complutense University he again addressed scientists personally, calling them to active intervention: "Men and women who represent science and culture: you have enormous moral force! It is in your power to act in such a way that science primarily serves the culture of man, and that it can never be perverted and used for his destruction! [...] Consciences must be awakened. Your responsibilities and your opportunities to influence public opinion are immense" (November 3, 1982, *Insegnamenti*, V, 3 (1982), p. 1099).

The relationship between theology and science is of particular importance and John Paul II considered the subject systematically in a letter sent on June 1, 1988 to Fr. George Coyne, director of the Vatican Observatory. The letter is included in the Acts of the Study Week on *Our Knowledge of God and Nature* (cf. Russell et al., 1988). The themes raised in the letter were later discussed by a group of scientists and academics in a collective publication (cf. *John Paul II: On Science and Religion*, 1990). Sierotowicz (1995) synthesized the content of the *Letter* into three main points: the relationship of unity between science and theology; the autonomy and distinction of religion and science (religion is not founded on science, nor is science an extension of religion); the possible reciprocal advantages that both science and theology would gain from such a dialogue.

The same subjects are discussed in later contributions, now giving particular attention to the new cultural context, a context ever more marked by a tendency to irrationality, by minimalist conceptions of human reason and by a neo-spiritualist climate such as that of the *New-Age*. Addressing participants of the Study Week organized by the Pontifical Academy of Sciences on the theme *Science in the Context of Human Culture*, on October 29, 1990, John Paul II highlighted that "the progress of science does not come about without hard work and a thorough application, which are the fruits of an asceticism and honesty which do honour a true scholar. [...] Scholars themselves must show the validity of scientific research and its ethical and social legitimacy in the face of the anti-scientific and irrational currents which threaten our present culture. Defending reason is a priority demand of every culture" (*Discourse to the Pontifical Academy of Sciences*, October 29, 1990, in *Papal Addresses*, 2003, pp. 320-321). The Pope encouraged the members of the Academy to continue their high-quality specialized studies and at the same time to favor the interdisciplinary openness of research.

John Paul II reaffirmed the value of reason over *fideism* during a visit to the Ettore Majorana Center of Erice, on May 8, 1993. He deftly emphasized the renewed possibility of an encounter between science and faith, indicating the context and the values of the human person as the natural field for such an encounter—in harmony with the anthropological views of Wojtyła the philosopher. It is the human person who recognizes the progress of his or her knowledge as a gift, a gift not infrequently unexpected, and who always displays gratitude and wonder before the endeavors of his or her intelligence.

Finally, for the occasion of the Jubilee for Men and Women from the World of Learning, which took place in Rome from May 23 to 25, 2000, the Pope once again proposed the message of *Fides et ratio*, suggesting a new consonance between faith and reason in order to counter the threat of a fragmented knowledge and not to yield to the widespread culture of suspicion and doubt. Individual researchers

will be able to uphold this commitment if they wisely remain open to the needs of the human person. Quoting Jean Guitton, the Pope stressed that in scientific research the spiritual must never be separated from the intellectual, and that science and technology have an indispensable need to return to the interior value of the human person (cf. *Open your Mind to the Creator's Presence*, May 25, 2000, ORWE May 31, 2000, pp. 1-2).

The Magisterium of John Paul II has contributed to remove any doubt about the possibility of a Church's subjection in the face of modern culture. It is a Magisterium that firmly regained the Church's responsibility to announce the Gospel, making positive proposals in many fields. It conveys the conviction that religion and wisdom respond to a need that mankind has always had, especially to the pressing needs of humanity of the third millennium. This idea was already expressed by Pope Paul VI, and is stated with particular authority by John Paul II in the closing comments of his address in the Cologne Cathedral: "In the past precursors of modern science fought against the Church with the slogans reason, freedom and progress. Today, in view of the crisis with regard to the meaning of science, the multiple threats to its freedom and the doubt about progress, the battlefronts have been inverted. Today it is the Church that takes up the defense: of reason and science, which she recognizes as having the ability to attain the truth which legitimizes them as a human realization; of the freedom of science, which is what gives science its dignity as a human and personal good; of progress, at the service of a humanity which needs progress to safeguard its life and its dignity" (*Meeting with Scientists and Students in Cologne Cathedral*, November 15, 1980, n. 5).

V. The Teachings of the Church on some Key Issues

Certain themes that have been the subject of controversial debates, especially in relation to the Church's position, were tackled by the Magisterium of the Church as well, and gave rise to some specific teachings. Once brought together, these teachings provide evidence of an original approach and of a capacity to apply often repeated general criteria to individual cases. Although most of these criteria reach the public opinion by means of papal declarations, nonetheless they are teachings that belong to the common doctrine of the Church, grounded in the message of Judaeo-Christian Revelation, aimed at clarifying what concerns the doctrine of faith and what is left open to the free discussion of theologians (cf. above, I). For a more detailed analysis the reader is asked to refer to specific articles of this Encyclopaedia. Here we limit ourselves to indicating four crucial subjects.

1. The Origin of the Universe. By the early decades of the 20th century, the discoveries of astrophysics and the formulation of new cosmological models led the Church's Magisterium to confront the natural sciences over the question of [creation](#). As known, the belief in creation has strong implications on the relationship between God and the world, and occupies a central place in the whole of Christian doctrine.

In a famous address to the Pontifical Academy of Sciences in 1951—often quoted as an example of an inclination towards some form of Concordism—Pope Pius XII alluded to the Big Bang "as a witness to that primordial *Fiat lux*" (cf. *Discourse to the Pontifical Academy of Sciences*, November 22, 1951, in *Papal Addresses*, 2003, pp. 130-142). The truth is that, beyond the enthusiasm with which the latest astronomical discoveries were described in that speech, the Pope also spoke of subjects that still today are awaiting further investigation and confirmation; he nonetheless referred to the theological doctrine of creation as something that can certainly not be rejected by science, nor is it incompatible with any of the scientific results achieved by contemporary cosmology. The terms used in another address on September 7, 1952, at the *International Astronomical Union* (cf. *Discorsi e radiomessaggi*, XIV, pp. 275-285) made it implicitly clear that there was no intention to continue along the lines of that earlier allusion.

Exactly thirty years later, John Paul II referred to Pius XII's speech, addressing to the Pontifical Academy with a similarly broad-ranging discourse. On this occasion he clarified the distinction between the two approaches, that of Sacred Scripture and that of science, underlining his conviction

that the problem of the "beginning" of the universe was one that science alone could not resolve (cf. *Discourse to the Pontifical Academy of Sciences*, October 3, 1981, in *Papal Addresses*, 2003, pp. 249-252). Though with more emphasis on catechesis than on philosophy, John Paul II gave an exhaustive exposition of the doctrine of creation in the *General Audiences* held in Rome during the early months of 1986. According to that catechesis, reflection upon the creation has its ultimate aim in discovering therein the first evidence of the great love of God, who calls into existence from nothingness. At the same time, creation is the first prophecy of the new creation, that is, of the history of salvation. The 1986 catecheses provide references to cosmology, biology and ecology, and aim to clarify the usage of philosophical categories, such as being, existence, finalism, contingency, causality, nature, etc., often employed in quite an imprecise way in science popularization and even in some scientific theories.

2. *Origin and Evolution of Human Beings*. The Magisterium's first specific pronouncements on the theory of [evolution](#) date back to the first half of the 20th century, after that Darwin's theories were reformulated by biologists, giving rise to what is called "modern synthesis," or also neo-Darwinism. In 1941, again addressing the Pontifical Academy of Sciences, Pope Pius XII, having underscored the primacy of the human being at the top of the scale of living beings, and having noted the lack of exhaustive answers to the problem of the origins of our biological species, expressed his hope that research would continue without precluding any possible solutions (cf. *Discourse to the Pontifical Academy of Sciences*, November 30, 1941, in *Papal Addresses*, 2003, pp. 91-99).

The subject was covered more extensively in the Encyclical *Humani generis* (1950), with a number of important emphases. In the first place, no ban was placed on research founded on evolutionist ideas and it was affirmed that evolution was compatible with the doctrine of faith, so long as certain conditions were maintained. One of these was the pertinence of biology to concern itself within the limits of its own specific competence, in other words, by considering the biological aspect of human beings, to which, however, the human person cannot be reduced. Another was the maintenance of a clear distinction between working hypotheses and clearly proven facts (cf. [DH 3896-3897](#)). Pope Pius XII would return to this latter point three years later in a discourse to participants in the First International Symposium of Medical Genetics (cf. *Judicious Considerations and Norms concerning Medical Genetics*, September 7, 1953, *Discorsi e radiomessaggi*, XV, pp. 253-266).

John Paul II discussed the subject in the penultimate of the previously mentioned series of [General Audiences on creation](#). The admissibility of the hypothesis of evolution, as it was expressed by *Humani generis*, was reconfirmed: "From the viewpoint of the doctrine of the faith, there are no difficulties in explaining the origin of man in regard to the body, by means of the theory of evolution. [...] According to the hypothesis mentioned, it is possible that the human body, following the order impressed by the Creator on the energies of life, could have been gradually prepared in the forms of antecedent living beings. However, the human soul, on which man's humanity definitively depends, cannot emerge from matter, since the soul is of a spiritual nature" (*General Audience*, April 16, 1986). This, then, is a decisive affirmation of the irreducibility of the [soul](#) (in other words of the spiritual dimension of the human being) to matter, and of its direct creation by God. It is worth noting that in the same period John Eccles, one of the greatest neurophysiologists of the 20th century, Nobel Prize winner for medicine in 1963, came to the same conclusion regarding such irreducibility, following his own personal scientific and cultural journey, and declaring his autonomy from any specific religious perspective.

The closing decades of the 20th century were marked by rapid progress in the biomedical sciences and by the presence of several diversified scientific positions with respect to the theory of evolution. New disciplines appeared on the scene, new lines of research were opened, and many studies drew benefit from an interdisciplinary approach. At the same time an ever greater number of scientists freed themselves from the burden of having to pay an "a priori" homage to neo-Darwinian theories and, without contesting the biological fact of evolution, point out what is still unresolved in the theoretical frameworks that aim to explain the mechanisms of evolution.

In the light of this ferment, John Paul II dedicated ample space to the question of evolution in a *Message* addressed to the plenary assembly of the Pontifical Academy of Sciences on October 22, 1996, on the occasion of the 60th anniversary of its foundation, with a discourse that the media immediately (and somewhat reductively) interpreted as a late recognition of Darwinism (cf. *Papal Addresses*, 2003, pp. 370-374; *Magisterium is Concerned with Question of Evolution for it Involves Conception of Man*, ORWE October 30, 1996, pp. 3 and 7; or. French text in OR October 24, 1996, pp. 6-7). Actually the text concerns several points. Firstly it launches an invitation to substitute the expression "theory of evolution" with its plural, "theories of evolution." This is not just a question of terminology, but of admitting a pluralism of interpretation that is now widely recognized. At the same time it is a warning against those preconceived interpretations that often take partial hypotheses and incomplete results as documentary proof to support ideological visions. This holds true not only for openly materialistic readings, but also for those which presume to be spiritualistic. Later in the same message, with reference to *Gaudium et spes*, the Pope indicates the principal reason for the Church's interest in the problem: at stake is the conception of the human being, whose nature and dignity is of being loved and desired by God in his own image. The question, then, goes far beyond a mere disagreement between intellectuals and has repercussions on the daily life of any and all believers. The view of the human being taught by biblical Revelation and by the Church's reflection means establishing an "ontological discontinuity" in the chain of living beings; a discontinuity that concerns a level different from that of scientific observations and, therefore, that is not an alternative to the physical and biochemical continuity identified by science. What is more, similar models and paradigms of discontinuity are emerging even at a purely scientific level, making it less shocking to accept the idea of a level of existence (that of human beings) incommensurable with those that preceded it on the scale of evolution. In any case, an appropriate distinction between different levels of knowledge will help to avoid misunderstandings. It must be clear that the human phenomenon in all its fullness cannot be approached only with the instruments of scientific knowledge, and that it raises problems that can only be resolved by philosophical thought.

John Paul II's text also contains a statement immediately seized upon by the press, that is, the invitation to recognize that the theory of evolution is more than a hypothesis [according to the French original *à reconnaître dans la théorie de l'évolution plus qu'une hypothèse*; the published English translation was "has led to the recognition of more than one hypothesis in the theory of evolution"]. However, taking into account the whole document, this phrase is not to be interpreted as an official adherence to Darwinism as such (which certainly does not exhaust what "evolution" means). It is, rather, a realistic and serious recognition of the huge amount of experimental proofs and verifications that continues to confirm the fact of evolution, not yet available at the time of *Humani generis*. By thus highlighting the remarkable convergence of many elements that confirms evolution, the Magisterium of the Church aims to distance itself from the controversial positions of those who are known as "creationists," particularly widespread in the United States, and whose assertions (often based on a misunderstood biblical literalism) do not facilitate, but rather obstruct, a fruitful dialogue between science and religion.

3. *The Galileo Affair*. Limiting ourselves to the Magisterium's direct interventions concerning the case of Galileo Galilei and the problems it created, we may begin with an allusion contained in Pope Leo XIII's Encyclical *Providentissimus Deus* (1893). Though speaking from a general point of view, the document seems to contain a reference to the Galileo affair. Probably referring to the exegesis of Scriptures in relation to issues raised by the natural sciences, the Pope says: "The unshrinking defense of the Holy Scriptures, however, does not require that we should equally uphold all the opinions which each of the Fathers or the more recent interpreters have put forth in explaining it; for it may be that, in commenting on passages where physical matters occur, they have sometimes expressed the ideas of their own times, and thus made statements which in these days have been abandoned as incorrect." This question had anyway implicitly accompanied biblical exegesis since a longer time.

After the heliocentric debate of the 16th-17th centuries, we have to go as far as Vatican II in order to find the first explicit reference, though it is just a footnote, to the condemnation of Galileo, and the first

critical standpoint with regard to that verdict. *Gaudium et spes* (n. 36) says: "we cannot but deplore certain habits of mind, which are sometimes found too among Christians, which do not sufficiently attend to the rightful independence of science and which, from the arguments and controversies they spark, lead many minds to conclude that faith and science are mutually opposed." Note n. 7, which accompanies this text, indicates as the only reference Pio Paschini's essay *Vita e opere di Galileo Galilei*, published just a year earlier by the Libreria Editrice Vaticana. In reality, the records of the Council bear witness to a fairly heated debate inside the Committee that worked on the preparation of the document. An official pronouncement on the Galileo case had been proposed. A first draft of the paragraph quoted above spoke of errors on the part of the Church and of the commitment not to repeat them, using the condemnation of Galileo as an example (cf. Fantoli, 1996, ch. 7, pp. 523-531). The troubled history of Paschini's book is symptomatic of the difficulties in arriving at a clear position in the years before the Council. In fact, the work on this book began in 1941 under the guidance of the Pontifical Academy of Sciences presided by Fr. Agostino Gemelli, and was completed in three years. Nevertheless, it was published twenty years later, two years after the death of the author, having undergone numerous corrections.

The perspectives opened by *Gaudium et spes* were brought to fruition by John Paul II. One year after his election, while participating in a commemoration of Einstein's centennial at the Pontifical Academy of Sciences, the Pope surprised everyone by inviting theologians, scientists and historians, animated by a spirit of sincere collaboration, to "study the Galileo case more deeply, in loyal recognition of wrongs from whatever side they come," hoping that this «will dispel the mistrust that still opposes, in many minds, a fruitful concord between science and faith, between the Church and the world» (*Discourse to the Pontifical Academy of Sciences, November 10, 1979*, in *Papal Addresses*, 2003, pp. 241-242). The Pope himself immediately suited deed to word and appointed a commission, under the presidency of Cardinal Paul Poupard, with the mandate to investigate in various fields: exegesis, culture, science, epistemology and history. A series of initiatives followed, among them the publication of *I documenti del processo di Galileo* (edited by Sergio Pagano, 1984) which contains all the documentation, held in the Vatican Secret Archives, currently available on Galileo's trial. John Paul II has returned to this subject on a number of occasions, such as on the 350th anniversary of the publication of the *Dialogue Concerning the Two Chief World Systems* (cf. *Discourse to an International Symposium of Scientists, May 9, 1983*, ORWE 30.5.1983, p. 7; cf. also Poupard 1987); and during his visit to the University of Pisa (cf. *Address at the University of Pisa*, September 24, 1989, ORWE October 30, 1989, p. 13). Following ten years' work, on the 350th anniversary of the scientist's death, the commission presented the results of its findings, and John Paul II commented on them during the plenary session of the *Pontifical Academy of Sciences on October 31, 1992* (cf. *Papal Addresses*, 2003, pp. 336-343).

In a certain sense, John Paul II's address would seem to have closed the case; he spoke of tragic reciprocal incomprehension and of painful misunderstanding, which also by virtue of recent studies belongs to the past. What the Pope really did was to relaunch the question of the relationship between science and faith, but with an awareness of the new challenges that also science has to face. The subject of the 1992 Plenary Session of the Pontifical Academy, "The Emergence of Complexity in Mathematics, Physics, Chemistry and Biology," gives the opportunity to John Paul II to frame the Galileo affair in a wider epistemological context. This represents a more interesting way to consider the matter, one tries to overcome the historical polemic without losing the wealth of teaching that the Galilean epistemological break contains. It may be seen as an invitation to reflect on the nature of scientific knowledge and on its links with other forms of wisdom, at a moment of revision and epistemological uncertainty such as the present (comments and contributions on this subject in Poupard, 1994).

4. Genetic manipulations. The 20th century, which began with the re-discovery of the laws of heredity first formulated by Gregor Mendel, and witnessed in its second half an advance of incalculable importance with the birth of molecular biology, closed with a series of announcements concerning the

genetic manipulation of high-order living organisms, and the specter of possible radical alterations in human beings themselves

The Church's Magisterium, in keeping with her permanent commitment to defend the dignity of human beings and the inviolability and sacredness of human life, has paid particular attention to the development of biomedical science, to the extent that the Roman Catholic Church dedicated one of her Institutions to this question, founding on February 11, 1994, the "Pontifical Academy for Life."

On September 7, 1953, a few months after the magazine *Nature* published the article by J. Watson and F. Crick in which they announced that they had deciphered the double helix structure of DNA, Pope Pius XII addressed participants in the First International Symposium of Medical Genetics, with an appraisal of the utility of the application of genetic science to non-human living organisms. As for the human being, although holding that it was possible to share "the fundamental goal of genetics and eugenics of influencing the transmission of hereditary factors to promote what is good and eliminate what is harmful," Pius XII immediately distanced himself from neutralist positions concerning the methods used to reach that goal, and recalled "the fundamental difference separating the vegetable and animal world on the one hand, and man on the other" (cf. *Discorsi e radiomessaggi*, XV, pp. 253-266). Since then research has intensified, knowledge has become much greater, and the applications thereof have multiplied, to the point that the question of experimenting directly upon human beings cannot be avoided.

The theme of experimentation in medicine had already been touched upon by Pius XII who, having realized the inevitability of some kind of experiment on the human being, had called for "the necessary presuppositions of experimentation, its limits, its obstacles, its decisive basic principles" always needing to be kept in mind. At that time he expressed specific misgivings concerning the possible results of such experiments, and even more so concerning the methods used, going so far as to say: "When it is impossible to acquire information or any certainty about the possibility of its practical use, without a harmful and perhaps mortal experiment on living human beings, then the goal pursued is not enough to justify that experiment" (*Discourse to the Eighth World Medical Assembly*, September 30, 1954, *Discorsi e radiomessaggi*, XVI, pp. 167-179).

John Paul II has reiterated this theme on a number of occasions, also with reference to the growing applications of science and the sharpening of the debate. Following a first call for limits on experimentation, especially pharmacological and chemical experimentation (cf. *Discourse to Participants in two Conferences on Medicine and Surgery*, October 27, 1980, ORWE November 17, 1980, pp. 19-20) -limits dictated by the primary requirement to defend the psychophysical integrity of the sick- the problem of biological experimentation was dealt with more fully and came to touch on aspects associated with genetic manipulation. In an address to participants in the Study Week of the Pontifical Academy on "Modern Biological Experimentation" (October 23, 1982), and in another the following year to the general assembly of the World Medical Association (October 29, 1983), the Pope indicated the anthropological foundation that must dictate the criteria for evaluating any decisions, when the question at issue is not strictly therapeutic. "Each human person, in his absolutely unique singularity, is constituted not only by his spirit, but by his body as well. Thus, in the body and through the body, one touches the person himself in his concrete reality. To respect the dignity of man, consequently amounts to safeguarding this identity of man *corpore et anima unus*" (*Discourse to the World Medical Association*, October 29, 1983, ORWE December 5, 1983, p. 11).

In the address of 1982, moreover, a first unconditional standpoint was adopted with regard to the manipulation of the [human embryo](#). "I condemn in the most explicit and formal way, experimental manipulations on the human embryo, since the human being from conception to death, cannot be exploited for any purpose whatsoever." This position was reiterated the following year before the World Medical Association, with the laying down of the conditions to be respected in order for any intervention on genetic heritage to be morally acceptable. These conditions are: the identity, singularity and unity of the person.

The contents of the *Instruction* published by the Congregation for the Doctrine of the Faith in February 1987 are also rooted in a strong and philosophically well-founded conception of the human being. The *Instruction on the Dignity of Human Life and Procreation*, better known as *Donum Vitae*, recapitulates the teaching of the Magisterium of the Church concerning those forms of biomedical technology that enable intervention in the initial phase of human life and in the processes of procreation. An explicitly negative judgment is expressed regarding certain advanced methods of biomedical manipulation. "Also, attempts or hypotheses for obtaining a human being without any connection with sexuality through "twin fission," cloning or parthenogenesis are to be considered contrary to the moral law, since they are in opposition to the dignity both of human procreation and of the conjugal union» (*Donum vitae*, n. 6). The subject of the dignity of human beings, and the serious immorality of using human embryos fertilized *in vitro* or cloned in order to produce stem cells for therapeutic ends was taken up again in an address to participants in the 18th Congress of the Transplantation Society (cf. ORWE August 30, 2000, pp. 1-2). At the same time, alternative ways were suggested for producing this type of cell from adult organisms.

As experimentation has proceeded, as men and women of science and culture have taken up different standpoints, and as certain governments have introduced the first normative decisions, the Magisterium of the Church has continued to make its contributions, even entering into the merits of specific questions. On October 28, 1994, in a comprehensive address to the plenary assembly of the Pontifical Academy of Sciences, John Paul II expressed his appreciation concerning the value of research into mapping the human genome (the so-called Human Genome Project or HGP, as a contribution to a better understanding of the biological characteristics and behavior of the human being, especially for the therapeutic goals to which it could lead. At the same time, the Pope took up a standpoint on one of the most delicate questions associated with research on genomes: that of copyrighting the discoveries. He expressed his happiness that many scientists have opposed the use of copyrights in this field, and explained his position on the basis of the value of the human person, who is the beginning, the subject and the ultimate end of all research. Given that the human body is not an object to be used, the results of research must be communicated to the entire scientific community and cannot be the property of one small group (cf. ORWE November 9, 1994, pp. 3 and 15).

The subject of the human genome appears again in a discourse by John Paul II before the general assembly of the Pontifical Academy for Life on February 24, 1998, where he underlined the importance of deeper anthropological study into the subject, so as to shed light on the consideration that «by virtue of the substantial unity of body and spirit, the human genome not only has a biological significance, but also possesses anthropological dignity, which has its basis in the spiritual soul that pervades it and gives it life» (ORWE March 18, 1998, p. 5). Hence the unlawfulness of any intervention on the genome that is not aimed at the good of the human person, understood as the unity of body and spirit; and hence also the unlawfulness of any kind of discrimination against people on the basis of any genetic defects they are discovered to have, either before or after birth. On this occasion the Pope denounces the spread of a new form of selective eugenics, which tends to suppress malformed or defective embryos and fetuses, often by appealing to unfounded scientific theories on the ethical and anthropological difference between the various stages of development during prenatal life. This new form of eugenics is the expression of a reductive conception of the human being, one in which an idea of the quality of life, evaluated on the basis of sociological parameters, prevails over that of the sacredness of life, which has ontological foundations.

Documents of the Catholic Church related to the subject:

Abbreviations and complete titles of the documents

Vatican Council I, DH 3015-3020; Vatican Council II, Message to the scientists, 8.12.1965, EV 1, 487*-493*; Dei Verbum, 10, 12; Lumen gentium, 20-25; Gaudium et spes, 33-36, 43-44, 53-62. John Paul II: Discourse to the Pontifical Academy of Sciences, 10.11.1979, Papal Addresses pp. 239-244; Meeting with

scientists and students in the Cologne Cathedral, 15.11.1980, ORWE 24.11.1980, pp. 6-7; The responsibilities of science and technology, Hiroshima, 25.2.1981, ORWE 9.3.1981, pp. 15-17; Letter to Director of the Vatican Observatory, 1.6.1988, OR 26.10.1988, pp. 5-7. *Donum veritatis*, 13-24; *Catechism of the Catholic Church, Key-points concerning Faith, Reason and Scientific Knowledge*, 1997; *Fides et ratio*, 5, 25, 29, 34, 88, 96, 108.

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The Catholic Church's magisterium is exercised without this solemnity in statements by popes and bishops, whether collectively (as by an episcopal conference) or singly, in written documents such as catechisms, encyclicals, and pastoral letters, or orally, as in homilies. These statements are part of the ordinary magisterium of the church.Â statements of the ordinary magisterium is infallible, but the Catholic Church holds that the Church's infallibility is invested in the statements of its universal ordinary magisterium: "Although the bishops, taken individually, do not enjoy the privilege of infallibility, they do, however, proclaim infallibly the doctrine of Christ on the following conditions: namely, when, even though dispersed throughout the world but preserving for.