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**The experience of God through creation.
The faith of scientists and the meaning of prayer as praise to a Creator**

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Table of contents:

1. Introduction: let us start with the Council Vatican II.
2. Why the “glimpse of Christian faith” may help to understand better what the world is and to know better what is the role of human being in the universe?
3. Some examples: G. Lemaître, P. Teilhard de Chardin, E. Medi, X. Le Pichon.
4. In our practical scientific life: how to transform our world and our scientific works into worship?
5. Some texts of interest

1. Introduction: let us start with the Council Vatican II

A theological framework to understand the specific vocation of the laity in general, and of the scientists in particular.

Vatican II, *Lumen gentium*, n. 31:

“The term laity is here understood to mean all the faithful except those in holy orders and those in the state of religious life specially approved by the Church. These faithful are by baptism made one body with Christ and are constituted among the People of God; they are in their own way made sharers in the priestly, prophetic, and kingly functions of Christ; and they carry out for their own part the mission of the whole Christian people in the Church and in the world.”

What specifically characterizes the laity is their secular nature. It is true that those in holy orders can at times be engaged in secular activities, and even have a secular profession. But they are by reason of their particular vocation especially and professedly ordained to the sacred ministry. Similarly, by their state in life, religious give splendid and striking testimony that the world cannot be transformed and offered to God without the spirit of the beatitudes. But the laity, by their very vocation, seek the kingdom of God by engaging in temporal affairs and by ordering them according to the plan of God. They live in the world, that is, in each and in all of the secular professions and occupations. They live in the ordinary circumstances of family and social life, from which the very web of their existence is woven. They are called there by God that by exercising their proper function and led by the spirit of the Gospel they may work for the sanctification of the world from within as a leaven. In this way they may make Christ known to others, especially by the testimony of a life resplendent in faith, hope and charity. Therefore, since they are tightly bound up in all types of temporal affairs it is their special task to order and to throw light upon these affairs in such a way that they may come into being and then continually increase according to Christ to the praise of the Creator

and the Redeemer.”

2. Why the “glimpse of Christian faith” may help to understand better what the world is and to know better what is the role of human being in the universe?

2.1 Science is really a source of wonderment that leads to praise God as Creator

The wonderful *unity* of the world (synchronical and diachronical unity) disclosed by Physics and Biology:

- Unity of matter (structured by the same elementary particles, 3 families of quarks and leptons, and 4 [quasi-unified] fundamental interactions).
- Unity due to history: expansion of the universe from a very heavy and hot state, explaining the nucleosynthesis of all chemical elements.
- Unity between physical world and biological world: “biotic” (in particular anthropic) constraints.
- Unity of the biological substrate (nucleotides, RNA, DNA, aminoacids, proteins; cells,,)
- Unity due to history (evolution).

2.2 The wonderful *unity of Mathematics* and the marvelous effectiveness of mathematics in natural sciences

A key passage from the annual address that Benedict XVI delivered to the Roman Curia, December 22, 2008:

“Faith in the creator Spirit is an essential element of the Christian creed. The fact that matter carries within itself a mathematical structure, or is full of spirit, is the foundation upon which the modern natural sciences are based. It is only because matter is structured in an intelligent way that our spirit is capable of interpreting it and of actively remodeling it. The fact that this intelligent structure comes from the same creator Spirit who also gave spirit to us brings with it a duty and a responsibility. It is in faith concerning creation that the ultimate foundation of our responsibility for the earth is found. This is not simply our property, which we can exploit according to our interests and desires. It is, instead, a gift of the Creator who designed its intrinsic order, and in this way provided the instructions for us to consult as administrators of his creation. The fact that the earth, the cosmos, reflect the creator Spirit also means that their rational structures that, beyond mathematical order, become almost palpable in experimentation also bear within themselves an ethical orientation. The Spirit who shaped them is more than mathematics: he is Goodness in person, who, through the language of creation, shows us the way of the just life.”

See also Benedict XVI, *Discourse at the Meeting with youth people*, on April 6, 2006, in St Peter’s Square.

2.3 From the creation to the Creator

- From unity to intelligibility and from intelligibility to Intelligence.

Psalm 18 (19)

Vatican II, *Gaudium et spes*, 36:

“Now many of our contemporaries seem to fear that a closer bond between human activity and religion will work against the independence of men, of societies, or of the sciences.

If by the autonomy of earthly affairs we mean that created things and societies themselves enjoy their own laws and values which must be gradually deciphered, put to use, and regulated by men, then it is entirely right to demand that autonomy. Such is not merely required by modern man, but harmonizes also with the will of the Creator. For by the very circumstance of their having been created, all things are endowed with their own stability, truth, goodness, proper laws and order. Man must respect these as he isolates them by the appropriate methods of the individual sciences or arts. Therefore if methodical investigation within every branch of learning is carried out in a genuinely scientific manner and in accord with moral norms, it never truly conflicts with faith, for earthly matters and the concerns of faith derive from the same God. Indeed whoever labors to penetrate the secrets of reality with a humble and steady mind, even though he is unaware of the fact, is nevertheless being led by the hand of God, who holds all things in existence, and gives them their identity. Consequently, 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.

But if the expression, the independence of temporal affairs, is taken to mean that created things do not depend on God, and that man can use them without any reference to their Creator, anyone who acknowledges God will see how false such a meaning is. For without the Creator the creature would disappear. For their part, however, all believers of whatever religion always hear His revealing voice in the discourse of creatures. When God is forgotten, however, the creature itself grows unintelligible.”

- The risk of cosmic religiosity and of pantheism (Einstein, Hawking, de Duve)

An interview published in 1930 in G.S. Viereck's book *Glimpses of the Great*, in response to a question about whether or not he believed in God, Einstein said:

“Your question [about God] is the most difficult in the world. It is not a question I can answer simply with yes or no. I am not an Atheist. I do not know if I can define myself as a Pantheist. The problem involved is too vast for our limited minds. May I not reply with a parable? The human mind, no matter how highly trained, cannot grasp the universe. We are in the position of a little child, entering a huge library whose walls are covered to the ceiling with books in many different tongues. The child knows that someone must have written those books. It does not know who or how. It does not understand the languages in which they are written. The child notes a definite plan in the arrangement of the books, a mysterious order, which it does not comprehend, but only dimly suspects. That, it seems to me, is the attitude of the human mind, even the greatest and most cultured, toward God. We see a universe marvelously arranged, obeying certain laws, but we understand the laws only dimly. Our limited minds cannot grasp the mysterious force that sways the constellations. I am fascinated by Spinoza's Pantheism. I admire even more his contributions to modern thought. Spinoza is the greatest of modern philosophers, because he is the first philosopher who deals with the soul and the body

as one, not as two separate things.”

Einstein shares a kind of cosmic religiosity which is non compatible with a faith in a Creator:

According to Einstein “science without religion is lame, religion without science is blind.” And he goes on saying:

“A person who is religiously enlightened appears to me to be one who has, to the best of his ability, liberated himself from the fetters of his selfish desires and is preoccupied with thoughts, feelings and aspirations to which he clings because of their super-personal value. It seems to me that what is important is the force of this superpersonal content... regardless of whether any attempt is made to unite this content with a Divine Being, for otherwise it would not be possible to count Buddha and Spinoza as religious personalities. Accordingly a religious person is devout in the sense that he has no doubt of the significance of those super-personal objects and goals which neither require nor are capable of rational foundation ... In this sense religion is the age-old endeavor of mankind to become clearly and completely conscious of these values and goals and constantly to strengthen and extend their effect. If one conceives of religion and science according to these definitions then a conflict between them appears impossible. For science can only ascertain what is, but not what should be...”

• Two guidelines to avoid the risk of cosmic religiosity:

a) St Thomas Aquinas: *Summa Theologiae*, I, q. 45, a. 7: “Whether in creatures is necessarily found a trace of the Trinity?”

“I answer that, Every effect in some degree represents its cause, but diversely. For some effects represent only the causality of the cause, but not its form; as smoke represents fire. Such a representation is called a "trace": for a trace shows that someone has passed by but not who it is. Other effects represent the cause as regards the similitude of its form, as fire generated represents fire generating; and a statue of Mercury represents Mercury; and this is called the representation of "image." Now the processions of the divine Persons are referred to the acts of intellect and will, as was said above (Q[27]). For the Son proceeds as the word of the intellect; and the Holy Ghost proceeds as love of the will. Therefore in rational creatures, possessing intellect and will, there is found the representation of the Trinity by way of image (*per modum imaginis*), inasmuch as there is found in them the word conceived, and the love proceeding.

But in all creatures there is found the trace of the Trinity (*repraesentio Trinitatis per modum vestigii*), inasmuch as in every creature are found some things which are necessarily reduced to the divine Persons as to their cause. For every creature subsists in its own being, and has a form, whereby it is determined to a species, and has relation to something else. Therefore as it is a created substance, it represents the cause and principle; and so in that manner it shows the Person of the Father, Who is the "principle from no principle." According as it has a form and species, it represents the Word as the form of the thing made by art is from the conception of the craftsman. According as it has relation of order, it represents the Holy Ghost, inasmuch as He is love, because the order of the effect to something else is from the will of the Creator. And therefore Augustine says (*De Trinitate*, VI, 10) that the trace of the Trinity is found in every creature, according "as it is one individual," and according "as it is formed by a species," and according as it "has a certain relation of order." And to these also are reduced those three, "number," "weight," and "measure," mentioned in the Book of Wisdom (9:21).

For "measure" refers to the substance of the thing limited by its principles, "number" refers to the species, "weight" refers to the order. And to these three are reduced the other three mentioned by Augustine (De Nat. Boni iii), "mode," "species," and "order," and also those he mentions (QQ. 83, qu. 18): "that which exists; whereby it is distinguished; whereby it agrees." For a thing exists by its substance, is distinct by its form, and agrees by its order. Other similar expressions may be easily reduced to the above."

b) A comment on the Account of the Magi, Matthew 2:1-12. See also the text of Benedict XVI, Homily, January 6, 2008.

2.4 The "glimpse of Christian faith" and our understanding of the Universe and Human Life

Many metaphysical, ethical and anthropological questions induced by scientific practices remain completely unsolved in the context of science itself and even inside many philosophical frames (mainly those inspired by analytic philosophy for example). Christian faith does not deny scientific knowledge, but sheds new light on those questions giving interesting and answers endowed with a great level of intelligibility and rationality.

Christian faith is not an "option amongst others", as it gives compelling answers to questions (about foundations, values, meaning) induced by sciences (but the latter cannot give answer inside their methodological fields) and sometimes left open by contemporary philosophical thought.

Examples:

A. The doctrine of Creation:

- conveys a strong foundation for the source of the existence itself (of the world). This doctrine provide a compelling answer to the question: "why is there something in place of nothing" and to the fact of relative autonomy of the universe (*auto-nomos*: the universe has its own laws).
- conveys by the existence of a Logos, an explanation to the surprising intelligibility of the world (what is incomprehensible is the fact that the world is deeply understandable!)
- conveys an explanation for the link between human beings and the cosmos (sheds light on the biotic and anthropic constraints): creation contains something which allows the emergence of intelligent and free being (the Creation has a *telos*).
- The cosmos and the biosphere are characterized by evolution, history (expanding universe and Darwinian evolution). What is the meaning of these histories? The existence of a theological *telos* can bring a very interesting and deep explanation without destructing any elements of scientific discoveries.
- We discover in the world many degrees of freedom, many contingencies: we are not completely determined, prisoners of the physical and biological determinisms. There is thus a place for free will and free action. But why? What is the meaning of this fact? In

fact, the Christian idea that we are “co-creator”, that we have to complete the creation with the help and the grace of God, gives a hint to discover this meaning. Free will is also something that is fundamental to ground ethical attitude (cfr B.).

B. Christian Ethics

- With sciences only and with the plurality of contemporary philosophies we have no foundation for ethics and no very deep guidelines for our behavior. Very often we contemporary thought is oscillating between a pure naturalism and a position admitting that ethics is purely subjective or conventional. We are forced to act, but how is it possible to regulate our actions? For example one is saying, as Hans Jonas, that we have to respect future generations, but why? On which grounds? Here Christian ethics based on natural law can help us to found our ethics and to go beyond naturalism and conventionalism, relativism. In this context human being is not only a biological system, he is the top of the creation, created as an image of God with a spiritual soul. Then there is a ground to respect him during all his life, from the beginning to the end.
- One can say also that the doctrine of Incarnation gives an infinite value to human life and existence: we discover the ground of the respect of human existence that is understood intuitively by many persons.
- Summary: Science cannot ground ethics; ethics (as we can check it in our social life) can be only conventional. Where can we found compelling foundations for ethics? Christian approach gives rational elements to think really about compelling foundations of ethics.

C. Doctrine of Redemption

- The problem of evil and suffering is the strongest problem philosophy has to face. Science shows at the same time a wonderful universe and also some deregulations, some processes which are going wrong. There is no satisfactory and compelling explanation for all aspects of the evil problem. This can lead to desperate position. But Christian faith opens the horizon with the doctrine of Redemption.
- Furthermore, Christian faith gives reason to fight strongly against the evil and the suffering. And it provides also deep meaning for the life of those who are suffering. Without this meaning which is the deep value of the fragile, weak and suffering person?

3. Some examples of great scientists who praised The Lord and who emphasized the importance of worship.

- Mgr Georges Lemaître
- Fr. Pierre Teilhard de Chardin, s.j.
- Prof. Enrico Medi

"O you mysterious galaxies... I see you, I calculate you, I understand you, I study you and I discover you, I penetrate you and I gather you. From you I take light and make it knowledge, I take movement and make it wisdom, I take sparkling colours and make them poetry; I take you stars in my hands and, trembling in the oneness of my being, I raise you above yourselves and offer you in prayer to the Creator, that through me alone you stars can worship" (E. Medi, *Inno alla creazione*)

• Prof. Xavier Le Pichon.

4. In our practical scientific life: how to transform our world and our scientific works into worship?

To praise the Lord for his creation.

To pray for our colleagues and students.

To offer his work during the Holy Mass.

To work always in the presence of Almighty God, Creator and Redeemer

To give a Christian testimony inside the labs or in the classrooms by his own attitude, his ethics...

5. Some texts of interest:

John Paul II, *Address to the Participants to a Conference on Cosmology*, July 6, 1985

John Paul II, *Address for the Jubilee of Scientists*, May 25, 2000

Benedict XVI, *Homily for the Solemnity of Epiphany*, January 6, 2008

Benedict XVI, *Address to the Members of the Pontifical Academy of Sciences*, October 31, 2008

Benedict XVI, *General Audience*, March 24, 2010 (about St. Albert the Great)

Psalm 8

Psalms 104

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G. S. Viereck, *Glimpses of the Great*, Duckworth, 1930, pp. 372-373.

A. Einstein, "Religion and Science", *New York Times Magazine*, November 9, 1930, pp. 1-4.