

Lectures on Science and
Theology



Documentazione Interdisciplinare di
SCIENZA & FEDE

Philosophical and Historical
Perspectives

Lecture 1

Is Scientific Knowledge Relevant to Theology?

The influence of contemporary scientific
world-view on the work of theologians

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Summary

1. Is the Scientific Knowledge of Nature Relevant to Theology? A Short *Status Quaestionis*
2. Paths from Science to Theology and from Theology to Science
3. The Scientific Image of the World and its Main Implications in Understanding Christian Revelation
4. The Challenge of the Natural Sciences to the Work of Theologians: Source of Troubles or Origin of Positive Insights?



Creation of the two great Lights
(Duomo of Monreale, XII Century)

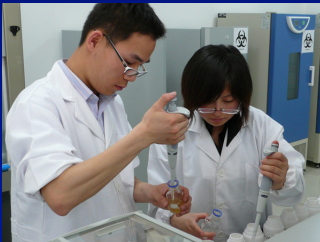
1. Is the Scientific Knowledge of Nature
Relevant to Theology?

A Short Status Quaestionis

■ The Science & Religion “movement” involves many authors today: however, they are mainly scientists, historians, and philosophers. The number of theologians is still small, especially among Catholics.

Here are some possible reasons:

✓ the natural sciences are difficult to understand and complicated to handle, compared with philosophy, history, or the human sciences in general;



✓ theologians seem to be interested more in ethical problems, which regard applied science, than in fundamental scientific research;

✓ generally speaking, the image of science given by the media and by popularizers is somewhat contradictory, so that theologians hesitate in evaluating the real import of scientific results.

■ The greater weight attributed to the humanities is due:



✓ to their role as auxiliary sciences in the study and the interpretation of Holy Scripture and other historical and literary sources useful for theology (hermeneutics, history, philology, etc.),

✓ to the relevance they have to study the personal and existential circumstances of the addressee of the Gospel message (psychology, sociology, anthropology, etc.)



Nevertheless, the rationality of contemporary men and women is now shaped by the canons of *scientific* rationality and by modern tech tools

■ A look at the teachings of the Catholic Church's Magisterium during the past decades

✓ it is easy to find statements encouraging the dialogue between theology and science;

☞ it is less easy to find

✓ statements which acknowledge **the influence of scientific thought over theology**

✓ reflections on the possible role that science could play in **nourishing the theological work as such.**





Pope Leo XIII, *Providentissimus Deus* (1893):

“Knowledge of the natural sciences will be of great help to the teacher of Sacred Scripture. Indeed there should be no real disagreement between the theologian and the physicist, provided that each confines himself within his own territory, watching out for this, according to St. Augustine's warning, ‘not to make rash assertions, and to declare the unknown as known’ ” (DH 3287).

No specific reference to the natural sciences is made in:

- the Vatican II Constitution *Dei Verbum* (1965), devoted to the divine Revelation,
- the Document of the PBC *The Interpretation of the Bible in the Church* (1993),
- the post-synodal exhortation *Verbum Domini* (2010)



However, the Second Vatican Council made reference to the *natural* sciences in several ways:

- ✓ Pointing out that scientific rationality shapes the mentality of men and women of our times
- ✓ Affirming the autonomy that science and other human activities have, when working to achieve their results according to their own methods
- ✓ Acknowledging that human progress (and scientific progress as part of it) is part of God's plan of redemption over creation and history
- ✓ Asking theologians to take scientific progress into account, in order to dialogue with men and women of our times and announce the Gospel properly.

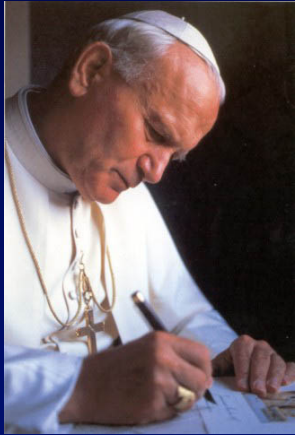


“The recent studies and findings of science, history and philosophy raise new questions which effect life and which demand new theological investigations.

Furthermore, theologians, within the requirements and methods proper to theology, are invited to seek continually for more suitable ways of communicating doctrine to the men of their times;

for the deposit of Faith or the truths are one thing and the manner in which they are enunciated, in the same meaning and understanding, is another.”

(Gaudium et spes, 62)



It is in the teachings of John Paul II, often given in the form of addresses to the world of academia and of learning, that we find a *development* of Second Vatican Council's view on science. In particular, he underlined the following points

- ✓ as all culture, scientific culture is a value in itself, it has a spiritual dimension and contributes to the intellectual dignity of the subject
 - ✓ scientific enterprise participates in human search for truth
 - ✓ scientific research must be carried out in a responsible way: technology, aimed at the transformation of the world, is justified on the basis of the service it renders man and humanity
 - ✓ theology and science, Church and the Academy, must work together for a peaceful progress of human society
- and
- ☞ theology should consider scientific results for a better understanding of Revelation



**John Paul II
(1978-2005)**

“Might contemporary cosmology have something to offer to our reflections upon creation? Does an evolutionary perspective bring any light to bear upon theological anthropology, the meaning of the human person as the *imago Dei*, the problem of Christology — and even upon the development of doctrine itself?

What, if any, are the eschatological implications of contemporary cosmology, especially in light of the vast future of our universe? Can theological method fruitfully appropriate insights from scientific methodology and the philosophy of science?

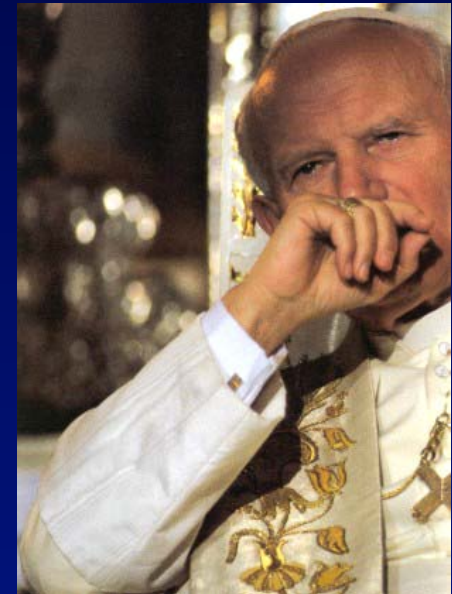
Questions of this kind **can be suggested in abundance**. Pursuing them further would require the sort of intense dialogue with contemporary science **that has, on the whole, been lacking among those engaged in theological research and teaching.**”

(Letter to the Director of the Vatican Observatory, June 1, 1988)

“Our gatherings have also enabled me to clarify important aspects of the Church’s doctrine and life relating to scientific research.

We are united in our common desire to correct misunderstandings and even more to allow ourselves to be enlightened by the one Truth which governs the world and guides the lives of all men and women.

I am more and more convinced that scientific truth, which is itself a participation in divine Truth, can help philosophy and theology to understand ever more fully the human person and God’s Revelation, a Revelation that is completed and perfected in Jesus Christ.”



Address to the
Pontifical Academy
of Sciences,
November 10, 2003

A still pertinent explanation of why natural philosophy is relevant to theology was that provided by **Thomas Aquinas** (cf. *Summa Contra Gentiles*, II, 2-3).

According to Aquinas “it is evident that the consideration of creatures has its part to play in building the Christian faith.”



Aquinas (1224-1274)

👉 It is worthwhile to follow the entire reasoning developed in Book II, chpts. 2-3, of *Contra Gentiles*. Here is the conclusion:

“It is evident that the opinion is false of those who asserted that it made no difference to the truth of the faith what any one holds about creatures, so long as one thinks rightly about God. For error concerning creatures, by subjecting them to causes other than God, spills over into false opinion about God, and takes men’s minds away from Him, to whom faith seeks to lead them.”

■ Theology and the Natural Sciences: Authors and Views between Past and Present Times

✓ Until 150 years ago, the *ratio studiorum* of seminaries included subjects such as: astronomy, mathematics, biology, natural sciences ...

✓ *Dictionary of Scientific Biographies*
(16 vols., New York 1970-1980):

- in the 18th century the percentage of scientists who were also clerics of Christian churches still covers 30% of all biographies there reported
- this percentage falls drastically to 10% in the early 19th century, and
- is reduced to a few authors in the 20th century.

Just for fun, look at the *some* great scientists of the 18th – 20th Century who were also clerics:



Roger Boscovich (1711-1787)

Lazzaro Spallanzani (1729-1799)

Giuseppe Piazzi (1746-1826)

Angelo Secchi (1818-1878)

Gregory Mendel (1822-1884)

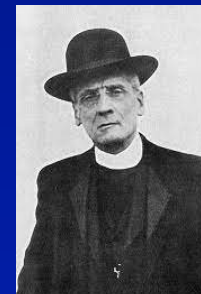
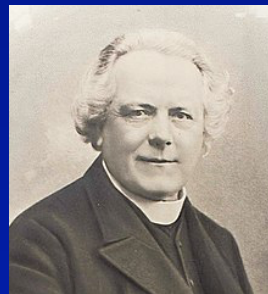
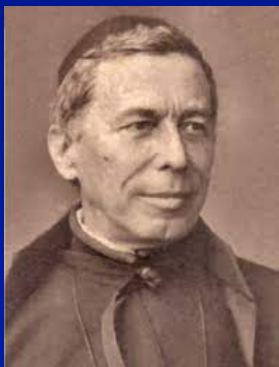
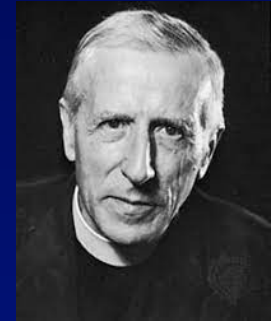
Antonio Stoppani (1824-1991)

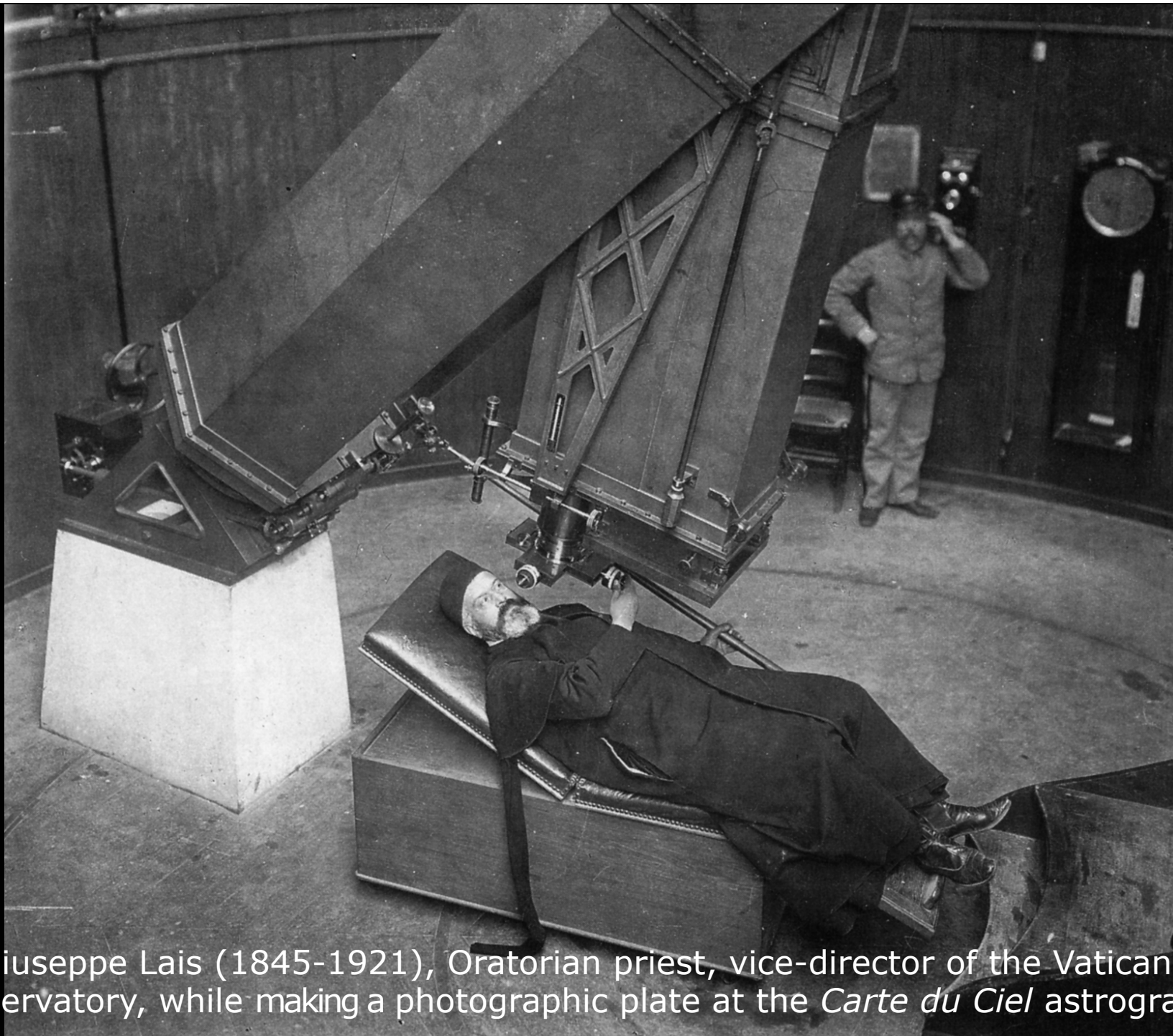
Giuseppe Mercalli (1850-1914)

Pierre Teilhard de Chardin (1881-1955)

Pavel Florenskij (1882-1937)

George Lemaître (1894-1966)





P. Giuseppe Lais (1845-1921), Oratorian priest, vice-director of the Vatican Observatory, while making a photographic plate at the *Carte du Ciel* astrograph



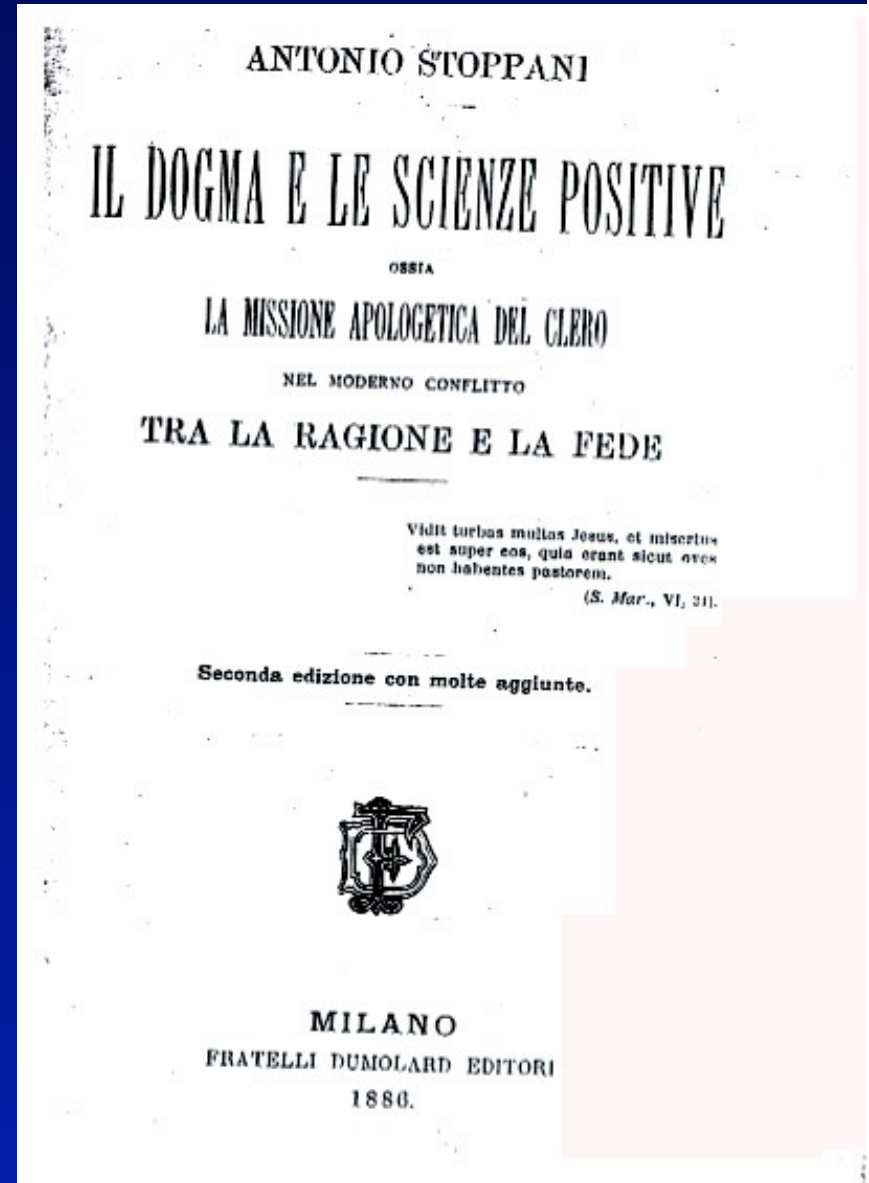
Palermo, December 1870, Angelo Secchi, co-founder of the Italian Society of Spectroscopists. Work group during the 1870 solar eclipse scientific mission

Antonio Stoppani, *Dogma and the Positive Sciences, or the Apologetic Mission of the Clergy in the Modern Conflict between Reason and Faith* (1886)



Stoppani's view was summarized by the aphorism "to clarify the errors of science with science."

He underlined the need for a deeper competence of the clergy in scientific matters, so that the questions on the table would not be avoided or underestimated, but addressed with knowledge of the facts and employed to the greater benefit of theology.



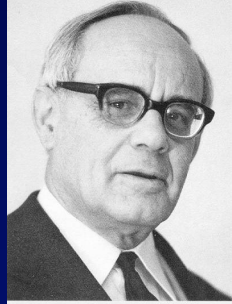


The Jesuit paleoanthropologist Pierre Teilhard de Chardin (1881-1955) deserves a separate discussion.

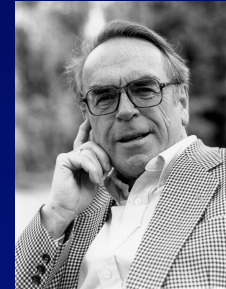
He was not a theologian nor did he use the natural sciences *strictu sensu* within a systematic theological project. However:

- he has greatly influenced and continues to influence theology
- he tried to read the results of science – viz. cosmic and biological evolutionary perspective – in the light of the History of salvation
- he succeeded in offering a reading of the Incarnation and the Paschal Mystery of Christ within a cosmic perspective
- he greatly emphasized the role of science and scientists in the mission of the Church.

Nevertheless, his language and method are not theological in character, and his panentheism still waiting for a better hermeneutics



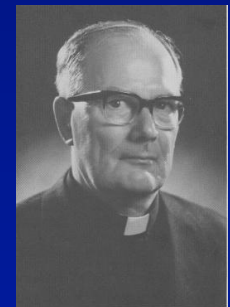
Karl Rahner (1904-1984), *Theology as Engaged in an Interdisciplinary Dialogue with the Sciences* (1975); *On the Relationship between Theology and the Contemporary Sciences* (1975); *Natural Science and Reasonable Faith* (1981)



Jürgen Moltmann (n. 1926), *God in Creation* (1985); *Science and Wisdom* (2002)



Wolfhart Pannenberg (1928-2014), *The Doctrine of Creation and Modern Science* (1988); *Epistemology and theology* (1973); *Toward a Theology of Nature. Essays on Science and Faith* (1993)



Bernard Lonergan (1904-1984) *Insight. A Study of Human Understanding* (1957); *Method in Theology* (1972)

Thomas F. Torrance, Denis Edwards, Juan Luis Ruiz de la Peña, Karl Heim, Langdon Gilkey, Eric Mascall, Alister McGrath, John Polkinghorne, Jean-Michel Maldamé



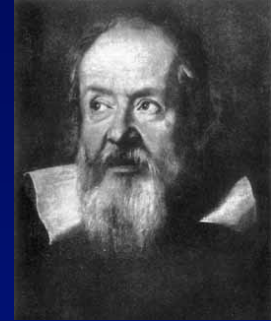
*Separation of the waters over the sky from
the waters under the sky*

(Duomo of Monreale, XII Century)

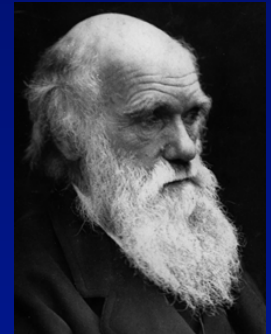
2. Paths from Science to Theology and from
Theology to Science

■ Some Commonplaces in relating Science to Theology

✓ Theology is seen as a brake, opposed to scientific progress. It would cause resistance to novelty, to accept what is *new*, because of the *old* biblical vision of the world



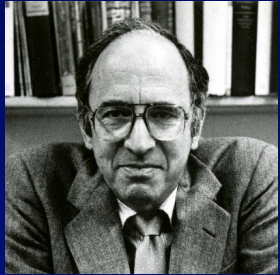
✓ Christian theology is *identified* with sacred Scripture (often read in a literalist way), ignoring the richness of theological tradition, the results of biblical exegesis, and the development of dogma achieved by Church's Magisterium



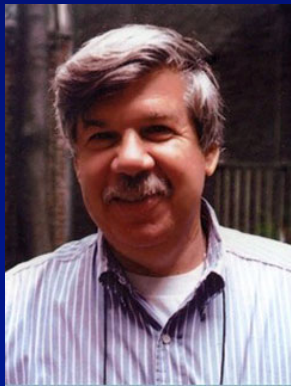
✓ The birth of scientific method was possible only by emancipating the natural sciences *from (or, against)* philosophy and theology.



■ Easy (but fallacious) ways to relate Theology and Science (and promote dialogue between them...)



✓ Science would manage hypotheses only: theology should not take it too seriously. No conflict between them because scientific views would be only conventional and provisional



✓ Theology and Sacred Scripture convey a spiritual message, which has nothing to do with the history of facts; theology has no consequences for science, nor science has for theology



✓ Science and theology provide two completely different readings of the world, of life and of the human being, two among many possible readings. Anyone is allowed to choose the view he or she prefers, but without affirming it corresponds to a factual truth...

■ On more firm bases, two paths of reflection may be followed:

From Science to Theology

Take into account how knowledge brought about by the natural sciences may contribute to a *Logos on God*, as performed by theology

From Theology to Science

Consider how a *theological* comprehension of the world and of the human being might shed light on the activity of scientists...

- when reflecting upon the rationality and intelligibility of nature (epistemological level);
- when reflecting upon the human dimensions of their research activity (anthropological level)



“Nor is the light of faith, joined to the truth of love, extraneous to the material world [...]

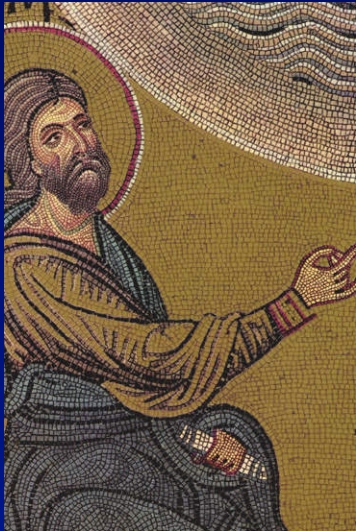
It also illumines the material world, trusts its inherent order and knows that it calls us to an ever widening path of harmony and understanding.

The gaze of science thus benefits from faith: faith encourages the scientist to remain constantly open to reality in all its inexhaustible richness. Faith awakens the critical sense by preventing research from being satisfied with its own formulae and helps it to realize that nature is always greater.

By stimulating wonder before the profound mystery of creation, faith broadens the horizons of reason to shed greater light on the world which discloses itself to scientific investigation.”

Lumen fidei, n. 34

■ To move along the first path, from Science to Theology, theology needs to take seriously what the insights coming from new scientific results may imply, namely:



- ✓ science is a source of knowledge for *that same reality*, the created world, which theology tries to understand and explain
- ✓ theology should express and convey in a new fashion some teachings of Christian faith, employing formulations respectful of the data provided by science;
- ✓ scientific knowledge provides an opportunity for the development of Christian dogma;
- ✓ science may help theology to make explicit, within the analogy of faith, some new implications contained in the truths of faith.

■ Along the second path, from Theology to Science, scientists should recognize the appeal that the Revelation may exert on their activity:

✓ nature as creation:

intelligible;

bearing a meaning;

ready to be studied in an inductive way;

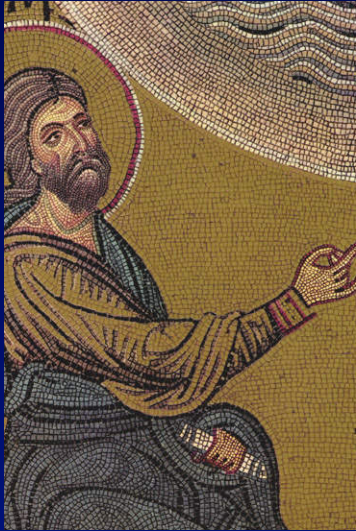
and able to let scientists deduce universal properties starting from local properties, etc.

✓ the human being as image of God:

able to understand the Word by whom creation is made;

entrusted by God with the task of safeguarding and transforming a world created *in statu viae*, i.e. in progress;

a free subject able to participate in God's creative power.



✓ time as history:

there is an origin and there is an end;

complexity is development, not merely complication...;

evolution is a meaningful process;

the physical universe is the place of a promise, one the cosmos is unable of fulfilling by its own;

✓ truth as meaning:

beyond the idea of truth as mere coherence or consistency, there is a ontological truth, which renders science a meaningful search for truth;

since the world has a meaning, then science is a personal and passionate commitment.



The rest of Logos on the seventh day
(Duomo of Monreale, XII Century)

3. The Scientific Image of the World. Its Main Implications in Understanding Christian Revelation



■ The extraordinary widening of the space-time horizon that now frames our understanding of the universe necessarily prompts theology to provide a “space-time re-setting” of humankind and its cosmic *habitat*.

Our new space-time context must be no longer ignored; just as, in the past, we could not ignore the new lands reached by great geographic discoveries or the new cosmological assessment originated by the Copernican revolution.

■ The time spanning from the formation of the first chemical elements to the appearance of life on earth (10 billion y), and from the rise of its most elementary forms to the appearance of humans (ca. 3.5 billion y), was incredibly long, much longer than people can imagine on the basis of historical time-scales.



■ Within their specific object and methodology, the natural sciences are capable of tracing back the key-steps of that history, and predicting its future scenarios.



■ Such a cosmic history tells us that the conditions fitting to host life are placed within suitable "time windows," which could not arise before a specific cosmic age, and that from a certain time onward, will no longer arise.



■ However,

far from being redundant, the wide spaces and the great time spans involved, have been strictly necessary to produce the conditions, places and times which allowed:

- the slow and patient synthesis of chemical elements;
- the subsequent formation of the physical scenarios;
- and biological niches suitable to host life.



■ There was a “primeval fine-tuning” between the physical structure of the universe and the chemical and biological necessary conditions which allow life to appear on earth, much more later, as it really happened (Anthropic Principle).

■ Such delicate conditions worked from the very beginning.

They cannot be explained in terms of natural selection, like Darwinian selection explained the fitness between the living beings and their *habitat*.

■ The meaningfulness of cosmic fine-tuning can be removed only by admitting, idealistically, that our Universe looks adequate for life only because selected among a set of infinite universes.



■ All forms of life on earth spring from a Life Universal Common Ancestor (LUCA).



■ The appearance and evolution of the diverse biological species seem to indicate the growing in time of ever more complex, organized, and specialized functions and morphologies. This long-term ascent is due not only to Darwinian selection, but also *to other factors*, whose morphogenetic action is still today a matter of study.



■ The origin of Human species can be understood as biologically evolved from other animal species, starting from the origin of a branch (Australopithecus) which separated from Apes around 4 millions years ago.

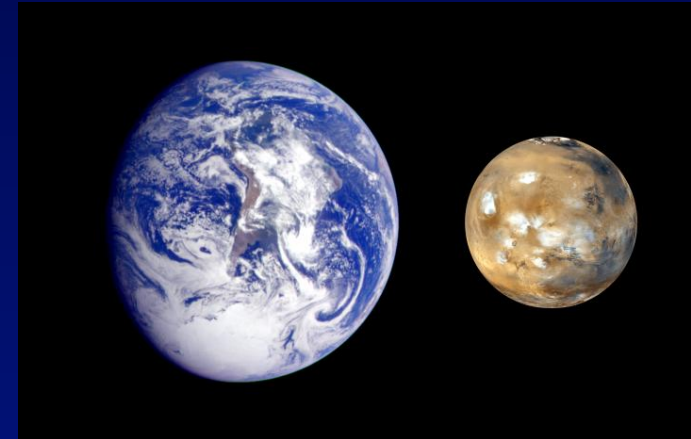


■ Human species knew a number of different subjects (*Homo habilis*, *Homo rudolfensis*, *Homo neanderthalensis*, *Homo sapiens*), among which only one (*Homo sapiens*, 150.000 years ago) survives today.



Last, but not the least...

■ Stars with orbiting planets is a widespread phenomenon. There are no observations of any form of life outside planet earth, but the hypothesis that life could have originated in planetary environments like ours is plausible.



Earth

Mars



■ Because of the very large dimensions of the Universe it is not possible (and never it will be), to have a complete information capable of denying, on experimental bases, such a possibility

Therefore, ET life is an event that cannot be excluded on the basis of a-priori arguments (scientific or philosophical).



Logos Pantocrator

(Duomo of Monreale,
XII Century)

4. The Challenge of the Natural Sciences to
the Work of Theologians:

Source of Troubles or Origin of Positive Insights?

What insights could theology gain from the new horizons opened by the natural sciences?

Mentioning just a few ones, among the others...



■ Thanks to contemporary science, theology can now better understand what it means to be a creature in a created world.

■ Due to our scientific view, we have a better insight on the content of terms such as *world, life, nature, universe, time, matter, etc.*, which are employed in theological language as well.

■ It is not without interest, for theology, to learn that the fine-tuning existing between physics and biology, upon which the actual possibility of life is based, was established in the very early stage of cosmic evolution; that is, well before the biological evolution began on our planet.



■ The Christian “Theology of the Body,” could receive new insights from the knowledge that our material body includes a very long cosmic and biological history; that is, it is able to summarize, in a certain sense, the whole of creation.

■ A deeper scientific knowledge of natural reality helps theology to understand what to take care of creation implies and the extent of the responsibilities of the human beings

■ A better knowledge of nature clarifies what it means to participate, in Christ, in “recapitulating” the whole of creation to the Father, through the Spirit; that is, how the human beings have to cooperate in bringing to fulfillment a universe created in *statu viae*, i.e. in progress

Scientific knowledge stimulates theologians' agenda to address some challenging questions...



- To elaborate a syntheses between the *uniqueness* of the Christian event (Incarnation, Redemption and Resurrection) and the *plurality* of the cosmic context
- To provide a synthesis between cosmic history and the History of salvation, that is, to think in terms of a *physical* history of salvation
- Exploring the feasibility of a *theology* of nature
 - God's revelation through nature
 - Creation, information and finality
 - The natural world between promise and fulfillment
 - The Christological dimension of nature

☞ Theology does not possess any complete answers to these paramount challenges

Nonetheless, theologians know that a firm terrain exists in which those questions can be properly tackled.

This terrain is the sound relationship between Christ, who is the Incarnate Word, and the material cosmos



■ Since all things were made through Him and for Him, and He holds them all together (cf. *Col* 1:16-17),

the deepest truth of all created reality, including its physical and biological dimensions as well as its space-time evolution, lies in the mystery of the Incarnate Word,

which Christians confess to be the center of the cosmos and of history.

👉 in conclusion...

- Theology (and theologians) should regain the familiarity that, in past centuries, they had with scientific knowledge
- There are a number of commonplaces in relating science to theology that must be avoided, as well as a number of easy, but fallacious ways, to promote the dialogue between them
- Theology should take seriously the insights coming from contemporary scientific world-view, even when challenging and asking theology for new dogmatic syntheses
- Scientists should recognize the appeal that Judaeo-Christian Revelation exert on their activity, when presenting nature as creation and the human being as image of God
- And, finally, theology should not see science (only) as a source of troubles, but (also) as a positive boost to comprehend better the Word and the works of God.

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