

What Is the Importance of Science to Faith?
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Introduction

Science and faith are in harmony. Not only do they mutually promote each other, but they also depend on one another. Einstein once said, "Science without religion is lame. Religion without science is blind."¹ Revealed faith often provides keys to difficult philosophical questions. *Science*, in turn, *offers evidence that faith is reasonable*.

In this essay, after clarifying our terms, I will show how truly scientific investigations about the origins of the universe and of life on Earth can lead one reasonably to conclude that there is a God behind these mysteries. Then I will explain how Judeo-Christian culture supplied the right frame of mind regarding the cosmos, and consequently under these conditions science was able to hatch and grow. Next I will delve into the debate about the Shroud of Turin, one of the most dramatic issues in the Western world's dialogue between science and faith, to show that the truly scientific evidence points towards its authenticity. In the conclusion I will peer into the implications these reflections may have.

Science, Faith, and Their Possible Relationships

Reality is complex. It can't be studied completely from just one point of view. We all desire to know, and we know through different means. Knowledge first comes to us through the senses. If we aid our senses with scientific instruments such as telescopes, microscopes, and x-ray machines, we can acquire more precise measurements of physical phenomena. We can also obtain knowledge by reasoning from already known premises to a conclusion, or simply by a complete understanding of the terms.

Science clearly cannot explain all of reality. Science, which once meant "certain knowledge through the causes," is generally understood today as an enterprise that collects and organizes knowledge in the form of testable explanations and predictions about the world. This enterprise only deals with what can be measured. To borrow another quote from Einstein, "Gravitation is not responsible for people falling in love." Neither can science make an ethical equation and judge whether an action is good or evil. Science, then, is a valid means to help us know reality, but it has its limitations.

Faith, as well, does not explain all of reality. The term faith has several meanings, and from the start we should know how to distinguish one from another. Faith in general refers to a state of mind in which the mind freely gives firm assent to something as true, on the grounds of the authority of others. Human faith is the kind of faith that we have in the weatherman when he says it's not going to rain tomorrow. When tomorrow comes and it doesn't rain, we no longer *believe* him, since we have proof. Faith would cease being faith if the object of belief were already seen clearly. That doesn't mean, however, that faith is unreasonable. On the contrary, faith should be reasonable. It shouldn't clearly contradict any other knowledge of truths. In this essay we will be dealing with faith in God. God's grace weighs in and his authority is what counts for those who believe in him.

Now that we have defined the crucial terms of this essay, the next issue at hand is to identify the possible relationships between science and faith.² One of the most common views nowadays is that science and faith are in conflict. Heated debates between die-hard materialists and inflexible fundamentalists in political arenas are the stories that make the headlines. While rationalism rejects the existence of any transcendent being, fideism places its sole trust in blind belief in God.

¹ Quoted in R. LUCAS LUCAS, *Explicame la persona*, Edizioni ART, Rome 2010, 200.

² Cf. P. DOWE, *Galileo, Darwin, and Hawking: The Interplay of Science, Reason, and Religion*, William B. Eerdmans, Grand Rapids 2005 for a similar interpretation of their relationships, especially pages 1-8.

Rationalism tends to consider religion a thing of the past. Primitive peoples supposedly attributed to the gods whatever they could not explain. After centuries of scientific progress—they say—we know better. According to them, science is by now very close to explaining everything. Fideism, in contrast, fosters the kind of attitude that would more readily trust scripture than one's own eyes. For Christian fideists, for example, taking the Bible seriously means interpreting its passages literally, such as the first chapter of Genesis on the creation of the universe in six days.

Science and faith do not have to be in conflict, though. Some who see no conflict hold that science and faith are independent. This dualistic point of view implies that science and faith are irrelevant to each other. Finally, there are some who admit of an interactive harmony between science and faith. Such was the thought of Pasteur when he said, “A little science might separate you from God, but a lot of science will necessarily lead you to him.”³ Likewise, Stanley Jaki has argued that science developed in history thanks to the underlying notions of Christianity.⁴ It makes sense that the God who created the universe would also set humans on the right path to discover it through science. This last viewpoint has been endorsed by eminent Catholics since St. Justin in the second century, and it is by far the most convincing, as will be made clear throughout this essay.

Disputes over the Origin and Evolution of the Universe and Life

One of the hottest conflicts in the past century and a half has been waged between creationism and evolutionism. Creationists, usually consisting of fundamentalist Protestants, believe that God created the world exactly the way it is narrated in Genesis. Some have gone so far as to calculate the date and time of creation, based on information gleaned from the Bible. Evolutionists, in contrast, say that humans were not created, at least not directly, by a divinity, but that humans evolved, along with other animals, from a common ancestor. So who is right? Taken as the ideologies they have become, neither is. Each falls into unreasonable exaggerations of the evidence for its own position.

A middle road is the most levelheaded mindset. Catholic teaching, for example, is compatible with both creation and evolution, as long as they are understood correctly. The doctrine of creation elucidates that God created the universe. Whether he did so six thousand years ago or fourteen billion years ago is not a dogma. The Catholic Faith does not depend on a literal interpretation of the first chapters of Genesis. The basic message of these chapters is to expound that the world is a product of creative Reason, a God who is Logos.⁵ He intervened in a special way to form mankind in his image and likeness by giving each human person a spiritual soul, and when his humans soon rebelled against him, God did not abandon them. Although God could have created the universe in 4004 BC, complete with fossils in the Earth, it seems less reasonable that God would do so much to hide from us.⁶ Neither does he make his existence obvious, lest our freedom vanish, though it is possible for us to reason from effect to cause and thus demonstrate his existence.

On Earth, fossil evidence supports the theory that there has been some sort of evolution of living organisms. Pope John Paul II even said that the theory of man's evolution could not be considered a mere hypothesis.⁷ Belief in the theory of evolution is not the same as adherence to Darwinism, a materialistic evolutionary ideology. Although Darwin titled his famous book *On the Origin of Species*, he only attempted to explain the origin of new species from preexisting ones, not

³ Quoted in R. LUCAS LUCAS, *Explicame...*, 208.

⁴ “[O]ne can see Christ as the assurance for such notions as creation out of nothing, creation in time, a fully ordered universe, and purpose (cosmic and individual)—an assurance that alone assured the rise of science.” S.L. JAKI, *The Savior...*, 192.

⁵ Cf. BENEDICT XVI, Easter Vigil Homily 2011, in http://www.vatican.va/holy_father/benedict_xvi/homilies/2011/documents/hf_ben-xvi_hom_20110423_veglia-pasquale_en.html, [24-04-2011].

⁶ Cf. J. LESLIE, “How to Draw Conclusions from a Fine-tuned Cosmos,” in R.J. RUSSELL— W.R. STOEGER— G.V. COYNE, *Physics, Philosophy, and Theology: A Common Quest for Understanding*, Vatican Observatory, Vatican City 1988, 310.

⁷ Cf. JOHN PAUL II, Message to the Pontifical Academy of the Sciences, 22 October 1996, in <http://www.disf.org/Documentazione/05-3-961022-PASC.asp>, [29-04-2011].

the origin of living species themselves.⁸ The problem of the origin of life itself on Earth continues to puzzle scientists. It does not seem to follow necessarily from the laws of physics, and neither does sheer chance explain it.

The origin of the universe poses analogous problems. Scientific evidence of the universe's expansion suggests that almost fourteen billion years ago its size was minuscule. Measurements of the cosmic microwave background radiation even give a picture of the universe about four hundred thousand years after what has come to be called the Big Bang. The Big Bang is a scientific theory that agrees with great quantities of evidence; whereas creation, that is, creation out of nothing (*creatio ex nihilo*), is a philosophical and theological concept. The Big Bang, thus, is not equivalent to creation. There could have been other universes that preceded the Big Bang. Although these necessarily lie outside the scope of science, their theoretical existence still presupposes creation out of nothing.

Today's scientific theories sustain that in the first second the universe underwent a rapid inflation and then proceeded expanding. Most astrophysicists say that at the beginning it must have been a singularity. At a singularity, however, general relativity breaks down. No known physical law explains how singularities behave, let alone how a universe can come out of one.⁹ Another problem is how to interpret the assertion of an infinite density and temperature. Stephen Hawking's no-boundary theory avoids the singularity, but includes even more problematic issues, such as imaginary time,¹⁰ a gratuitous ontological interpretation of Feynman's "sum over histories" method,¹¹ and a creation by means of spontaneous quantum fluctuations.¹² Consequently, there is at present no satisfying scientific explanation of how the physical constants (the value of gravity, the Planck constant, the speed of light, etc.) came out of this initial stage of the universe.

What is interesting, though, is that these constants appear fine-tuned. If they were slightly different, the universe would look nothing like the way it does. Fred Hoyle, an agnostic cosmologist, said many years ago, "A commonsense interpretation of the facts suggests that a superintellect has monkeyed with physics, as well as chemistry and biology, and that there are no blind forces worth speaking about in nature."¹³ One approach to this fine-tuning is called the Anthropic Principle. Although this principle has different formulations, its purpose is to affirm that if the highly improbable values of our universe's physical constants were slightly different, we would not exist.

Conclusions drawn from this statement reflect each individual's personal philosophy. Believers in the existence of a transcendent being do not hesitate before concluding that this is evidence for God's intervention. An alternative solution has been introduced, however, based on the Many-Worlds Interpretation of quantum mechanics, which appeals to materialists and other individuals who acknowledge nothing beyond immanent reality. This interpretation holds that whenever a microcosmic event with different possible outcomes occurs, all outcomes are obtained, each one in a separate universe.¹⁴ If in this "multiverse" there are an infinite number of universes, then there is no need to postulate a Creator who fine-tunes the initial conditions, because from an infinite set all possibilities must be actualized. With no Creator, our existence, if not a fluke, becomes something that was bound to happen anyway. In other words, we shouldn't be surprised that we exist.

⁸ Cf. S.L. JAKI, *The Savior of Science*, Regnery, Washington D.C. 1988, 128.

⁹ Cf. M.M. CARREIRA, *Il principio antropico*, "La Civiltà Cattolica" 3641 (2002), 439-40.

¹⁰ Cf. S.W. HAWKING, *A Brief History of Time: From the Big Bang to Black Holes*, Bantam Books, New York 1988, 134.

¹¹ Cf. W.L. CRAIG, *The Grand Design — Truth Or Fiction?*, "Enrichment" (Winter 2011), 121-2.

¹² Cf. S.W. HAWKING – L. MLODIOW, *The Grand Design*, Bantam Books, New York 2010, 180.

¹³ F. HOYLE, "The Universe: Some Past and Present Reflections," an unpublished University of Cardiff preprint first quoted in E.C.W. DAVIES, *The Accidental Universe*, Cambridge University Press, Cambridge 1982, 118, quoted in S.L. JAKI, *The Purpose of It All*, Scottish Academic Press, Edinburgh 1990, 103.

¹⁴ Cf. L. VAIDMAN, *Many-Worlds Interpretation of Quantum Mechanics*, in E.N. ZALTA (ed.), "The Stanford Encyclopedia of Philosophy," Fall 2008 Edition, URL = <<http://plato.stanford.edu/archives/fall2008/entries/qm-manyworlds/>>.

The flaw behind this reasoning is the same hasty fallacy by which the Big Bang is equated with creation. However awkward the Many-Worlds Interpretation may be, it can account for the existence of life in a predominantly hostile universe. Nevertheless, it presupposes a universe. It does not explain why there is something rather than nothing, whereas the God hypothesis does. The Many-Worlds Interpretation cannot be verified or falsified, but God's existence can be proven in several ways.¹⁵ These two statements are thus on different levels.

While Earth appears to be a rare oasis of life, the unjustified assumption that there are many universes seeks rather to reaffirm the so-called Copernican Principle and put down what they see as the conceited delusion that we are important. Named after Copernicus, the sixteenth century Polish ecclesiastic who taught that the Sun, not the Earth, was the center of the Universe, the Copernican Principle asserts that our planet is not privileged. Optimistic astronomers speculated that there could be millions—even billions—of planets with life. Today, however, these numbers look naïvely optimistic. Unsuccessful hunts for extraterrestrial life and ever-increasing data about the surprising conditions that played a role in Earth's formation suggest that life could in fact be a rare phenomenon in the Universe. Out of the 1235 probable extrasolar planets surveyed in NASA's recent Kepler mission, only five of the sixty-eight approximately Earth-sized planets orbit their stars within the circumstellar habitable zone.¹⁶ If the existence of these planet candidates is confirmed, they still need to fit a surprising amount of criteria for us to consider them habitable. They need a stable axial tilt, which Earth has thanks to our unusually large Moon; plate tectonics, which have yet to be discovered on any planet other than ours; a strong magnetic field for protection; a stable planetary system; a sufficient quantity of the elements on which life is based; and an increasing number of other conditions.¹⁷

Scientific research suggests that Earth was formed about 4.5 billion years ago, and the first traces of life seem to date back to four billion of those years. In the early 1950s University of Chicago chemists Stanley Miller and Harold Urey produced chains of amino acids in a laboratory out of chemical substances. No one, however, has successfully produced ribonucleic acid.¹⁸ The change from a non-living conglomeration of elements to a living organism is an evolutionary leap that yet defies satisfactory explanations. The many transitions from unicellular organisms to primates took millions of years. Nevertheless, fossil evidence does not support the gradual progression theory originally proposed by Darwinists. One may call to mind the enigma of the Cambrian Explosion (580-500 million years ago), more like an abrupt burst of evolution.

The highly unlikely character of this unique event, as well as that of the mass extinctions recorded on our fossil record that have been conducive to our mammal-dominated planet, screams to heaven for a greater explanation than pure chance. Here we can see the rationality behind finalistic evolution, as opposed to Darwinism and neo-Darwinism. Materialistic evolution—Darwinism—rejects purpose and appeals to natural selection. Darwin, the father of the materialistic ideology of evolutionism (not the authentic father of evolution, which had already been proposed by Lamarck in 1809) relied on two external chance factors to explain evolution: natural selection and individual variations. Neo-Darwinists, accepting the contribution of Hugo de Vries, have substituted genetic mutation for individual variations. Despite their many unsuccessful predictions, Darwinism and other forms of evolutionism have not been discarded, a historical fact that hints at their non-scientific nature. These materialistic ideologies have long cast their spell on students, especially in English-speaking countries, spreading the myth that non-Darwinian biologists are practically non-existent.¹⁹

¹⁵ Cf. THOMAS AQUINAS, *Summa Theologiae*, I, q. 2, a. 3.

¹⁶ M. MEWHINNEY – R. HOOVER, “NASA Finds Earth-size Planet Candidates in the Habitable Zone,” in http://www.nasa.gov/mission_pages/kepler/news/kepler_data_release.html, [21-04-2011].

¹⁷ Cf. G. GONZALEZ – J.W. RICHARDS, *The Privileged Planet. How Our Place in the Cosmos Is Designed for Discovery*, Regnery, Washington D.C. 2004, for a thorough argument about how the conditions allowing for intelligent life on Earth are extremely improbable, but also make our planet strangely well suited for viewing and analyzing the universe.

¹⁸ Cf. P.D. WARD – D. BROWNLEE, *Rare Earth: Why Complex Life Is Uncommon in the Universe*, Copernicus Books, New York, 2004, 65.

¹⁹ Cf. S.L. JAKI, *The Savior...*, especially Chapter 4, “The Saving of Purpose,” 118-158.

The materialism that penetrates the thought of some contemporary scientists is largely unjustified and illogical. In *The Grand Design*, a recent book by Stephen Hawking and Leonard Mlodinow, the authors argue that free will, actually non-existent, is only employed as an effective theory. They begin with the assumption that if we have free will, it must have developed somewhere during the evolutionary process. Such a statement is not too unreasonable. Their “proof,” however, consists of a list of organisms that do not exhibit human behavior: blue-green algae, bacteria, multi-celled organisms in general, mammals in general, chimpanzees, cats, and roundworms of the species *Caenorhabditis elegans*.²⁰ Because none of these organisms exercise free will, they imply, free will doesn’t exist. Why not just consider human beings and leave the rest of living organisms alone? By sloppy induction, these scientists have neglected the only species worth investigating for signs of free will. Implicit in this argument is the unjustified supposition that there was no evolutionary leap between non-rational animals and rational humans. In other words, *Homo sapiens sapiens* is just another species of animals. They conclude that although everything we will do is already determined, it would take too much time to calculate how our brains make us behave. In this way we can talk about free will, as long as we are aware that it is just an effective theory.

Our brain does not determine what we do, although materialists would have us believe that. Not only our free will, but also our intelligence belong to an immaterial reality and cannot be explained away by complexity in matter. The term “intelligence,” when restricted to human beings (as it ought to be), refers to the capacity of abstraction, of forming concepts and judgments, and of reasoning. When people started talking about the “practical intelligence” animals are said to have, they were clearly not talking about the same thing. Some animals can solve a few specific problems, adapt to new circumstances, repeat useful experiences, or even form instruments. So-called “artificial intelligence” is an even more notorious abuse of language. All it indicates is the capacity to receive information, elaborate it, and give a response.²¹ By using the same word to describe a human capacity and a capacity we can infuse into inorganic material, materialists imply that not only is *Homo sapiens sapiens* just another species, but that in the final analysis all living beings are just complex machines.

Underlying these materialistic tendencies is an implicit philosophy of immanence, ever bound to be at loggerheads with the only other option, a philosophy of transcendence.²² Every person at some point comes to ask himself philosophical questions: “Why do I exist?”, “What determines right and wrong?”, “What happens after death?”, “Why is there something and not just nothing in existence?” In the face of countless problems of the same philosophical nature, all individual responses can be broken down into two: philosophies of immanence and philosophies of transcendence. At least analogous, though nearly parallel, is the unremitting struggle between faith and unbelief that Pope Benedict XVI spoke about in his recent Easter Vigil homily, which also introduces us into the next section of this essay:

[The creation account in the book of Genesis] tells us that, far from there being an absence of reason and freedom at the origin of all things, the source of everything is creative Reason, love, and freedom. Here we are faced with the *ultimate alternative* that is at stake in the dispute between *faith* and *unbelief*: are irrationality, lack of freedom and pure chance the origin of everything, or are reason, freedom, and love at the origin of being? Does the primacy belong to unreason or to reason? This is what everything hinges upon in the final analysis. *As believers* we answer, with the creation account and with Saint John, that in the beginning is reason. In the beginning is freedom. Hence it is good to be a human person. It is not the case that in the expanding universe, at a late stage, in some tiny corner of the cosmos,

²⁰ Cf. S.W. HAWKING – L. MLODINOW, *The Grand...*, 31-3.

²¹ Cf. R. LUCAS LUCAS, *L'uomo, spirito incarnato*, Edizioni Paoline, Milano 1993.

²² Transcendence here does not refer to Kantian transcendentalist philosophy or transcendental Thomism. It refers rather to the existence of something in an order and manner above and beyond all other things. Philosophies of immanence accept no such being. Here I address only materialistic philosophies of immanence, but other kinds include naturalistic and idealistic philosophies of immanence.

there evolved randomly some species of living being capable of reasoning and of trying to find rationality within creation, or to bring rationality into it. If man were merely a *random product* of evolution in some place on the margins of the universe, then his life would make no sense or might even be a chance of nature. But no, Reason is there at the beginning: creative, divine Reason.²³ (*italics added*)

It may be necessary to point out that what the Pope says faith rejects is not the theory of evolution, but only of dysteleological (random) evolution. Teleological evolution (tending toward an end) is compatible with faith in a transcendent being, admitted by the philosophies of transcendence. The facts that scientific cosmology and the other natural sciences have brought us do not contradict teleological reasoning. On the contrary, teleology makes evolution not only more probable, but the expected process by which a higher intelligence would naturally guide living beings to superior forms. It is sensible, then, for individuals to conclude that some transcendent being governs the cosmos, and this being we generally call God.

Science and Belief in Progress

Science does not always succeed in explaining its allotted portion of reality. More often than one would expect, scientists behold what believers call miracles. When mysterious occurrences cannot be explained by science, they too often just get ignored. Such is the case for over a hundred incorrupt bodies of saints, hundreds of Eucharistic phenomena, and thousands of healings, just to name a few examples. Hawking and Mlodinow, for instance, do not consider the existence of miracles a serious hypothesis.²⁴ Science is possible, according to them, because miracles are not. With a similar purpose in mind, Barrow and Tipler attempt to show the incoherence of fervent eighteenth-century scientists. These scientists, they explain, used Newton's equations of motion and gravitation to argue that God too was a mathematician, while at the same time others cited "the breakdown of their constancy, or miracles, as the prime evidence for a Deity."²⁵ It should not strike believers as contradictory, though, that God could momentarily suspend some of the physical laws that he himself had fine-tuned. If Jesus had not performed miracles during his public ministry, would it have been reasonable for anyone to believe in him? In normal people's lives, however, miracles are quite rare. What usually leaps out more at us is the regularity we observe in nature.

Einstein once said, "The most incomprehensible thing about the universe is that it is comprehensible." This underlying rationality of the cosmos is a hint at God's existence. For this reason Galileo (before Newton) said that nature was written in mathematical language. "Indeed," writes our present Pope, "in the magnificent mathematics of creation, which today we can read in the human genetic code, we recognize the language of God."²⁶ Antony Flew, previously a big critic of theism and of the universe's rationality, converted to theism in the first years of the millennium after reflecting on recent scientific discoveries. It makes sense to say that few scientists doubt the universe's comprehensibility; otherwise, why would they become scientists? But where did this common notion of nature's intelligibility come from? Typical textbooks of the history of science begin with the ancients and then skip to Descartes, Galileo, and Newton. These titans of modern science did not start from scratch, though. Besides being Christians themselves, they are above all indebted to Medieval Catholics such as Gerbert d'Aurillac, John Buridan, Nicholas Oresme, and Albert the Great for Arabic numerals, the impetus theory that went against Aristotelian physics, and developments in many of the sciences.

²³ BENEDICT XVI, Easter Vigil Homily 2011, in http://www.vatican.va/holy_father/benedict_xvi/homilies/2011/documents/hf_ben-xvi_hom_20110423_veglia-pasquale_en.html, [24-04-2011].

²⁴ Cf. S.W. HAWKING – L. MLODINOW, *The Grand...*, 34.

²⁵ J.D. BARROW – F.J. TIPLER, *The Anthropic Cosmological Principle*, Oxford University Press, New York, 1994, 30.

²⁶ J. RATZINGER, *Jesus of Nazareth: Holy Week: From the Entrance into Jerusalem to the Resurrection*, Ignatius, San Francisco 2011, translated by Philip J. Whitmore from the original German *Jesus von Nazareth: Zweiter Teil: Vom Einzug in Jerusalem bis zur Auferstehung*, Libreria Editrice Vaticana, Vatican City 2011, 193.

The affirmation that the universe is not only intelligible, but also good, and that humans are the pinnacle of the created universe was once particular to Judeo-Christian culture. It was precisely this culture's predominance in Medieval Europe that enabled science to arise in Western culture. Another significant impediment to the development of science was their notion of time as an unending cycle. If forgetfulness would inevitably return to humanity and bring people back to a primordial state, what was the point of progress? Judeo-Christian culture, on the other hand, introduced the notions of creation out of nothing (*creatio ex nihilo*) and linear time. In Christianity, the same God who created time along with the universe entered time in order to show humans the way to eternal life. The Incarnation, Death, and Resurrection of the Son of God were singular and unrepeatable events in history.²⁷ Nothing could have been more important. Nothing could have been more unexpected. Nothing could have been more profitable to humanity than a divine Redeemer.

The Shroud of Turin in the Light of Science and Faith

Jesus has always been a sign of contradiction, as was prophesied of him in his infancy.²⁸ He dedicated three years to public ministry, in which his aim was not to please the crowd. Rather, he came to speak the truth,²⁹ the truth that would set us free.³⁰ No wonder his enemies, preferring their own self-righteousness to the truth, put him to death by crucifixion. Their incessant war against Jesus, however, would not be soon over. He said he would rise on the third day. If he had stayed in the tomb, the Christian faith that spread over Europe in the next centuries would have been in vain,³¹ but he did not. While Christianity continues to be the most persecuted religion in the world, a crucial debate between science and faith revolves around the Shroud of Turin.

Could the Shroud have been the authentic burial cloth of Jesus? Well documented evidence traces its history back to Lirey, France in 1354, where it was found in the possession of Geoffrey de Charny. There was another cloth in the East, known under different names, such as the Image of Edessa (Mandylion – μανδύλιον), the cloth “folded in four” (Tetradyplon – τετραδύπλον), or the image “not made by hands” (Acheiropoietos – αχειροποίητος). Discovered in Edessa in 525 when a flood forced inhabitants to reconstruct the city, it was taken to Constantinople in 944 so that it could be better protected from the threatening Muslim hordes. During the sack of Constantinople in 1204, the climactic crisis of the Fourth Crusade, the Mandylion disappeared. Its sighting in Athens in 1206 counters the possibility of it having been burned in the chaos of Constantinople's catastrophe. Because Pope Innocent III condemned the sacking of Constantinople, no one wanted to be caught with such a valued relic. For this reason we should not wonder why it was never again seen, unless perhaps this cloth was the same one that would come to be known as the Shroud of Turin.

Considerable scientific evidence, systematically ignored by adherents to the dogma of radiocarbon's infallibility, supports the claim that the Mandylion is the same cloth as the Shroud of Turin. An artistic image of Jesus' burial in the Hungarian *Pray* codex, dated between 1192 and 1195, captures suggestive details of the Shroud, such as the herringbone weave (unknown in Medieval Europe) and the sets of L-shaped holes. Bloodstain coincidences between the Shroud of Turin and the Sudarium of Oviedo, which has been in Spain since the seventh century, leave little likelihood that they came from two different men. Iconographic comparison also suggests that artists used the face of the man of the Shroud as a model for their paintings of Jesus, even as early as the fourth century.

If skeptics dismiss these arguments as non-scientific, then all the more so should they doubt the carbon-14 dating, which concluded that the linen of the Shroud came from sometime between 1260 and 1390. Was the radiocarbon sample from the original Shroud? Joe Marino together with

²⁷ Cf. S.L. JAKI, *The Savior...*, 186.

²⁸ Cf. *Luke* 2:34.

²⁹ Cf. *John* 18:37.

³⁰ Cf. *John* 8:32.

³¹ Cf. *1 Corinthians* 15:12-19.

Sue Benford, and then later the chemist Ray Rogers, have presented objective evidence that it was not. Marino and Benford showed three different American textile experts pictures of the corner the sample was taken from. The experts replied that it was herringbone weave, but manipulated in some way, maybe rewoven. Marino and Benford published their paper in 2000, concluding that a significant portion of the sample was actually a patch of sixteenth century material.³² Ray Rogers, at first skeptical of Marino and Benford's studies, later examined the evidence on his own and found that they were right. He presented his findings in a scientific article in 2005, arguing that the radiocarbon date was not valid for determining the age of the Shroud because the sample was not part of the original cloth.³³ The radiocarbon dating done in 1988, therefore, was not a scientific test.

Nevertheless, science has indeed investigated the Shroud. Perhaps the most rigorous and thorough scientific investigation of the Shroud was done on October 8-13, 1978 by the Shroud of Turin Research Project (STURP). Twenty-four experts, most from the United States, spent 120 hours doing experiments one after another on the Shroud. One of their first findings was that it could not possibly have been a painting, for there was not a drop of pigment, ink or anything else that could have been used. Some object that iron oxide, which was found on the Shroud, was used as a pigment in Medieval Times. It was, but only with cobalt and manganese, which were not found on the linen of the Shroud. Because retting (soaking the flax plant for linen) produces iron oxide, it is logical to declare that that iron oxide comes from the linen itself. Furthermore, even if all the iron oxide found on the Shroud were heaped up into a pile, a microscope would still be necessary in order to see it. These facts considered together exclude the possibility that the image was a painting. Neither could it have been a photograph, for there was no silver found on it, not to mention that photography was invented in 1818. Moreover, the Shroud image contains three-dimensional information. The brightness of the image is proportional to the distance the body would have been from the cloth. With the help of a VP-8 Image Analyzer, first applied prior to the STURP investigation, scientists have been able to produce a three-dimensional replica of the body that the Shroud must have wrapped.

Another interesting find concerns the bloodstains. Fluorescent x-rays, ultraviolet rays, radiography, and other sophisticated means were used to verify the presence of human blood. The blood on the Shroud has not darkened, but has remained red, due to an abnormal abundance of bilirubin, evidence that the man of the Shroud was tortured. Ultraviolet fluorescent photography detected around the side wound a stain of serum, invisible to the naked eye.

Although a lot of claims are made about what can be found on the Shroud, it is not all to be believed. The only place to look for truth to the highest degree of certainty of which we are capable about any archeological object is in peer-reviewed scientific articles. The STURP team produced peer-reviewed science that points unanimously towards the Shroud's authenticity.

Determining the prospect of the Shroud's authenticity corresponds to science and not to faith. Science says the man of the Shroud died a violent death by crucifixion. The Gospels tell us of Jesus, who was beaten, crowned with thorns, and crucified. The Catholic Church will not declare that the man of the Shroud is Jesus. It is up to individuals to make that connection or to look for another explanation for the apparent congruence. God created us free, and he means to preserve our freedom.

Christians who believe that the man of the Shroud is Jesus often think his image on the Shroud is proof of the Resurrection. Because the formation of the image of the man still puzzles scientists, the most common theory among believers is that a burst of radiation at the instant of Christ's Resurrection left the image on the Shroud. The vaporograph theory, however, does not presuppose the Resurrection, but still explains how the image could have formed. First proposed by

³² J.G. MARINO – S. BENFORD, Evidence for the Skewing of the C-14 Dating of the Shroud of Turin due to Repairs, 2000, <http://www.shroud.com/pdfs/marben.pdf>, [24-04-2011].

³³ R.N. ROGERS, "Studies on the Radiocarbon Sample from the Shroud of Turin," in *Thermochimica Acta* 425 (2005), 189-194.

Paul Vignon in the early 1900s,³⁴ discarded by STURP, but then resurrected by Ray Rogers, the vaporograph theory says that a vapor emitted by the corpse, first from the nose and mouth, then from every pore, reacted with certain chemicals on the cloth and produced the marks by a Maillard reaction. Because the vaporograph theory uses known physical laws, it should be testable, although no one has yet succeeded in repeating an image closely like the one of the Shroud without omitting important details. A resurrection, on the other hand, cannot be repeated in a laboratory. Science cannot verify or falsify the supposed effects of Christ's Resurrection that could have caused the image on the Shroud. Such an event lies outside the sphere of science.³⁵ It is a matter of faith. Christian faith and belief in Christ's Resurrection depend neither on the source of the man's image nor on the Shroud's authenticity. They are based on the Gospels, not on the Shroud. Consequently, if the image was duplicated or if science were to demonstrate that the Shroud were a fake all along, belief in the Resurrection would remain intact. Faith would not be shaken.

Conclusion

Although science is not essential to faith, it can bolster it by providing evidence compatible with it. Galileo once said that two truths can never contradict each other.³⁶ By the nature of true science, if an objective scientific fact disagrees with a belief, faith has to give way. Conversely, whenever there could be opposition and is none, faith can come out strengthened.

As we have seen, there are sectors of reality that science does not encompass. Because science by itself cannot know all truths, there is room for faith in each person's life. Although contemporary cosmology approaches the very beginning of the universe, it can neither prove nor refute creation by a superior being. Although fossil evidence of evolution disagrees with a literal interpretation of the first chapter of Genesis, it does not preclude teleology. Rather, evolution guided by a superior intelligence is far more reasonable than random evolution. The intelligibility of the cosmos reflects such a higher intelligence that must have fashioned it. Christians call this the God who is Logos, the Word who became Flesh.³⁷ Jesus did not depart this world without leaving us an enigmatic portrait to know him by, whether it be his own or that of someone else who suffered an equally spine-chilling death. If what the Gospels tell us is true, Jesus rose from the dead and is now alive, though in a different ontological dimension, entirely outside of space and time, which are limited to the material universe.

Science tells us that the universe will eventually come to an end, whether it be by a Big Crunch, a Big Chill, or a Big Rip. The expansion of the universe could slow down and reverse. Space would recollapse and a final black hole singularity would engulf all matter. Although that might not mean the end of everything, it would definitely be the end of this universe. Observations of supernovae in 1997, however, suggest that the universe's expansion is actually accelerating, and in that case no future collapse is foreseen. Implications of the second law of thermodynamics will inevitably lead to a fading frequency in the formation of galaxies, stars, planets, and—in short—all material structures. Stars will burn all their fuel. Black holes will vanish after they release Hawking radiation. As the universe continues expanding, it will cool to the point that its average temperature approaches absolute zero. This would be the heat death of the universe. If there really is dark energy,

³⁴ Cf. R.K. WILCOX, *The Truth About the Shroud of Turin: Solving the Mystery*, Regnery, Washington D.C. 2010, 12-14.

³⁵ "Naturally there can be no contradiction of clear scientific data. The Resurrection accounts certainly speak of something outside our world of experience. They speak of something new, something unprecedented—a new dimension of reality that is revealed. What already exists is not called into question. Rather we are told that there is a further dimension, beyond what was previously known. Does that contradict science? Can there really only ever be what there has always been? Can there not be something unexpected, something unimaginable, something new? If there really is a God, is he not able to create a new dimension of human existence, a new dimension of reality altogether? Is not creation actually waiting for this last and highest "evolutionary leap", for the union of the finite with the infinite, for the union of man and God, for the conquest of death?" J. RATZINGER, *Jesus of Nazareth...*, 246-7.

³⁶ Cf. G. GALILEI, Letter to Benedetto Castelli, 21 December 1613, in http://www.disf.org/en/documentation/03-Galileo_PBCastelli.asp, [25-04-2011].

³⁷ Cf. *John* 1:14.

however, and the universe's expansion continues to accelerate to the point that infinite distances diverge in a finite amount of time, all structures would be torn apart. One way or another, this universe is doomed.

What then will be left? Is our existence an absurdity? Steven Weinberg would say so. In his closing remarks to *The First Three Minutes*, he stated, "The more the universe seems comprehensible, the more it also seems pointless."³⁸ If our thirst for knowledge will never be quenched, if material reality is all there is, if death is the end, then what is the purpose of it all? In the end, if we don't have faith, we don't have anything. Faith in eternal life, a reality that goes beyond the confines of this universe, gives meaning to our lives; it gives meaning also to science and to reason.

Faith and reason are like two wings on which the human spirit rises to the contemplation of truth; and God has placed in the human heart a desire to know the truth—in a word, to know himself—so that, by knowing and loving God, men and women may also come to the fullness of truth about themselves.³⁹

³⁸ S. WEINBERG, *The First Three Minutes: A Modern View of the Origin of the Universe*, William Collins Sons & Co. Ltd., Glasgow, 1977, 149.

³⁹ JOHN PAUL II, *Fides et Ratio*, 1998, introduction.