

THE TWO BOOKS PRIOR TO THE SCIENTIFIC REVOLUTION*

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Abstract

The relationship between the revelation of God through nature and through Scripture is here studied, by focusing on the metaphor of “the Two Books”, as it was used from the Fathers of the Church up to the XVII century. According to the majority of the Fathers, the book of Nature is as universal as the book of Scripture, and the content of each is to some extent equivalent. The authors of the Middle Ages emphasize that the capability of human reason to recognize God through the Book of Nature has been weakened by sin. Thus, it becomes necessary the reading of a “third” book, the Book of the Cross. The work of Raymond Sebond plays an important role to understand the historical evolution the metaphor underwent during the Renaissance and the Modern Age. The autonomy of the Book of Nature with respect to the Book of Scripture will increase accordingly, including the possibility to have access to an image of God different from that conveyed by Sacred Scripture. The way in which the metaphor is used during the Renaissance will pave the way to deism, in the XVIII century, and to naturalism, in XIX century.

*Omnis mundi creatura
quasi librum et pictura
nobis est et speculum*

Alan of Lille (XII century)
Hymn
(PL 210, 579)

The contemporary debate between science and theology often speaks of a comparison between the “Book of Nature” and the “Book of Scripture”. There are basically two ways in which this metaphor can be used. In the more general way, it refers to the comparison between the knowledge of nature achieved by science and the one we achieve reading the Judaeo-Christian Revelation, and thus understanding

nature as creation. In this case it is nothing but a different way of looking at the broad topic that is known as “Religion and Science”. However, there is a second, and more intriguing way, to use it. Actually, we can refer to the term “book” in a specific and definite manner; that is, as a document written by someone and addressed to someone else; a document that is intended to convey an intelligible content; a text that might require a certain effort to be properly interpreted and explained according to its author’s original and genuine meaning. But, we ask, how could this second way of understanding the metaphor be truly meaningful? In fact, if it is clear to everyone what we mean when we speak of the Book of Scripture, it might be less clear what we mean when we speak of the universe “as a book”. It is obviously a metaphor, but its usage admits various degrees and nuances: up to what point are we allowed to consider nature as a “book”? How was such a metaphor, that originated in a religious context, employed throughout the history?

When speaking of the relationship between the Two Books, one first thinks to what happened from the XVII century onward, that is, from the epoch in which the so-called “scientific revolution” began to put in question some relevant belief owned by the theological establishment. It was in that context when we began to speak of a “conflict” between the Two Books. Prior to that epoch the use of the metaphor might seem less significant, and the whole subject lacking in interest. In reality, the image of the Book had a wide literary usage well before the century of Galileo and Kepler. In this article I will focus precisely on what happened before the scientific revolution and try to shed light on three major questions: a) How were the “Two Books” mutually related and how was their content considered of some relevance to a better understanding of each other? b) How did the leading philosophical ideas concerning the Two Books evolve through history? c) What epistemological consequences are entailed when we accept that nature is a real and true book? While the first two questions include a historical perspective, the third one appeals to contemporary philosophy of science¹. However, a complete answer to this last question is beyond the aims of this paper. For this reason, I will confine myself to offer only a few hints about it, asking the reader to refer to the abundant literature existing on the topic.

1. Is Nature seen as a “book” through the pages of the Holy Scripture?

It is well known by everyone that the Holy Scripture introduces the created world as an effect of the Word of God: «Then God said, “Let there be light”, and there was

light...» (*Gen* 1,3). This relationship between the world and the Word is strengthened in the New Testament, which affirms the dependence of the entire universe on the Word made flesh: «in these last days, he spoke to us through a son, whom he made heir of all things and through whom he created the universe [...] and who sustains all things by his mighty word» (*Heb* 1,2-3). With this biblical basis, theological and philosophical literature apply to the created universe metaphors which deal with the word as such. By words we narrate a text, we pray hymns or sing a song. Comparing the creatures to the letters of a book, or to the voices of a choir, is thus in accordance with a theology of creation centered on the Word-Logos. It is worth noting that when using other images, for instance stating that natural things are like the footprint, the traces or the mirror of God Creator, such a link with the word is less clear, or even absent. The metaphor of nature as a Book, therefore, seems particularly consistent with a Christian theology of creation.

Turning our attention now to the way in which Sacred Scriptures imagine or describe the aspect of the cosmos, especially the appearance of the sky, we first of all find the metaphor of a tent or a curtain. The heavens are spread out, or even stretched out, like a tent over the Earth, as we read in many passages from the Psalms, the books of Job or Isaiah². The verbs here used correspond (Heb. *natâ*) to the action of pitching and fixing a tent, or rarely, to the action of extending a cloth³.

In a limited number of cases, and in the apocalyptic context of God's final judgement, we find an interesting expression. We read in the *Book of Isaiah*: «The heavens shall be rolled up like a scroll, and all their host shall wither away. As the leaf wilts on the vine, or as the fig withers on the tree» (*Is* 34,4). An almost parallel page is presented by the *Book of Revelation*: «Then the sky was divided like a torn scroll curling up, and every mountain and island was moved from its place» (*Rv* 6,14). These passages seem to indicate that, within the metaphor of the stretched curtain, the curtain is like a scroll; so the action opposite to that of laying out (or also of creating) the heavens is that of curling or rolling them back, similar to a scroll. Since “scroll” is nothing but the name used by the Bible to indicate a book, we have perhaps some indication that the heavens may be seen as both a curtain and a scroll. These are stretched out when God lays out the heavens, and will be rolled up in future times, in a new creation. From a merely philological point of view, we do not have enough data to conclude that the Holy Scripture sees Nature as a book, but the reading of some of these passages are at least inspiring in this respect.

It is also worth mentioning that in the Holy Scripture, particularly the *Book of Revelation* (cf. *Rv* 20,12), we find two more metaphors: the Book of Life and the Book of History. In chapter 5, we find the solemn vision of a mysterious scroll which had writing on both sides, that is outside and inside (cf. *Rv* 5,1; cf also *Ez* 2,9). An angel then proclaims in a loud voice: «Who is worthy to open the scroll and break its seals?» (*Rv* 5,2). After the Lamb of God appears and receives this mysterious scroll from the hand of the Most High who sits on the throne, the angels and the elders finally cry out in a loud voice: «Worthy is the Lamb that was slain to receive power and riches, wisdom and strength, honor and glory and blessing» (*Rv* 5,12). We will come back to the meaning of this scene at the end of this paper. For the moment, it is sufficient to emphasize that the literary association between “nature as creation”, and as a “book”, relies upon the clear association existing between the world and the Word, a relationship that is remarkably theological in character. God creates by his Incarnated Word and the world conveys a divine logos, i.e. contains and expresses the words of God.

2. The Fathers of the Church and the early Christian writers until Scotus Eriugena

The number of authors who have spoken of the book of Nature is very high. The proposal of a philosophical path to recognize a provident Creator starting from the observation of His works, and the view that through these works He speaks to us, are ideas which belong to the entire history of human culture, from the very beginning up until today. In any case, it seems that the attitude of looking at Nature as if it were a book first began to be clearly recorded in the early Christian literature. Although we cannot exclude that it was present in previous cultures, for writing techniques were spread throughout the Mediterranean area from 3500 B.C., it certainly arises within a religious context. The Fathers of the Church employ it in two main ambits, namely the so-called cosmological argument, by which they invited others to acknowledge a provident God-Creator starting from the observation of the order and beauty of the creatures, and the cosmic dimension of liturgy, for God had to be celebrated and praised in His glory also in the context of Nature. By the same words of Anthony the Abbot (3rd Century), probably the first example of hermitage, «my book is the created nature, a one always at my disposal whenever I want to read God’s words»⁴. As pointed out a bit later by Isaac of Nineveh, Nature was given to human beings prior to them receiving the sacred Scriptures⁵. Among the Fathers of the Church, explicit

references to the Book of Nature can be found, in St. Basil, St. Gregory of Nyssa, St. Augustine, John Cassian, St. John Chrysostom, St. Ephrem the Syrian, St. Maximus the Confessor. If we also include those authors who implicitly refer to the Book of Nature, for example those that said that God “speaks to us through creation”, the list would become much larger and quite uncontrollable⁶. It is enough, for our purposes, to offer here some quotes and afterwards to try to summarize some leading ideas.

According to the Greek father St. Basil of Caesarea (329-379) «We were made in the image and likeness of our Creator, endowed with intellect and reason, so that our nature was complete and we could know God. In this way, continuously contemplating the beauty of creatures, through them as if they were letters and words, we could read God’s wisdom and providence over all things»⁷.

Despite his preference for apologetic arguments based on an anthropological, rather than on a cosmological path, among the Latin Fathers it is St. Augustine (354-430) who dedicates various passages to the book of Nature, and interesting comparisons with the book of Scriptures are often involved. The following quote is, to this respect, very explicit: «It is the divine page that you must listen to; it is the book of the universe that you must observe. The pages of Scripture can only be read by those who know how to read and write, while everyone, even the illiterate, can read the book of the universe»⁸. «Some people — we read in one of his *Sermons* — in order to discover God, read a book. But there is a great book: the very appearance of created things. Look above and below, note, read. God whom you want to discover, did not make the letters with ink; he put in front of your eyes the very things that he made. Can you ask for a louder voice than that?»⁹. In a page of his *Confessions*, Ch. XIII, the metaphor of heaven as a book is combined with the biblical image of the starry sky stretched over us like a skin. God clothed our naked first parents with a skin just after they sinned, thus showing His mercy for us; likewise the heavens are a skin which also shows God’s mercy, because, reading them as in a book, human beings can know the will of God and behave in a virtuous and honest way¹⁰. Referring to creation, Augustine says: «For we know no other books which so destroy pride, which so destroy the enemy, who resists your reconciliation by defending his own sins»¹¹. In contrast to human beings, the angels do not need to read the heavens, for they always behold God’s face and perfectly know God’s will: indeed, God himself is their *book*¹².

With reference to our topic, a remarkable influence over the centuries that followed, especially during the Middle Ages, was exerted by Maximus the Confessor (580-662). In one of his works called *Ambigua*, commenting on the event of Christ’s

Transfiguration, he compares Nature and Scripture to two clothes with which the Incarnated Logos was endowed; the natural law being his humanity, and the divine law, revealed by Scripture, his divinity. These two laws were presented to us by means of two different books, Nature and Scripture. They veil and reveal the same Logos, they have the same dignity and teach the same things. Maximus is even more explicit: the two books have more or less the same content and he who want to know and carry out God's will, needs them both¹³. In reading the book of Nature, the deep mystery of the Logos does not vanish, nor is it destroyed. «The natural law, as if it were a book, holds and sustain the harmony of the whole of the universe. Material bodies are like the book's characters and syllables; they are like the first basic elements nearer to us, but allow only a partial knowledge. Yet such a book has also more general and universal words, more distant from us, whose knowledge is more subtle and difficult to reach. The same divine Logos who wrote these words with wisdom, is like embodied in them in an ineffable and inexpressible way. He reveals himself completely through these words; but after their careful reading, we can only reach the knowledge that he is, because he is none of those particular things. It is gathering with reverence all these different manifestations of his, that we are led toward a unique and coherent representation of the truth, and he makes himself known to us as Creator, by analogy from the visible, created world»¹⁴. It is worthwhile to mention here the great — and I would add the critical — equilibrium of Maximus Confessor. On one hand he affirms the need to know the natural law, and maintains that all that is contained in the Holy Scriptures is also contained in Nature (a statement which some centuries later would have brought about some problems, as we will see later). On the other hand, faithful to the Greek tradition, he is aware that the knowledge of God through the book of Nature remains veiled, deficient, and certainly inferior to that provided by the Bible.

In the 9th Century John Scotus Eriugena (about 810-877) recalled Maximus' image of the Transfigured Christ-Logos, recommending to comprehend the human clothes of Jesus, which indicate the material creatures¹⁵. At the very beginning of the history of salvation, he says, Abraham was invited to recognize God not looking at the Scriptures, that did not exist yet, but by looking up at the starry sky¹⁶. In the works of the Celtic theologian, the idea that God reveals himself through the two Books is also present. Nature and Scripture can be both considered as God's theophanies. «The eternal light manifests it to the world in two ways, through Scripture and through creatures. In no other way the knowledge of God is renewed in us but in the characters (Lat. *apices*) of Scripture and in the forms (Lat. *species*) of creatures»¹⁷.

In addition to the quotations collected here, if we also take into account how the relationship between faith and reason was formulated by the majority of the authors of this same period, the following general conclusions can be drawn:

a) The Fathers of the Church employ the cosmological argument (to infer the Logos-God or the divine from nature), one already known to the Platonic, Aristotelian and Stoic philosophical traditions, and use it to ascend from created beings to the Creator. The metaphor of nature as one of God's books is clearly present. When creatures are not compared to letters or words which make up a book written by God, it is nevertheless certain that God speaks to us through nature. The cue is often taken from passages of the Holy Scripture which offered a sound basis to endorse the practicability of such a path¹⁸.

b) The book of Nature is as universal as the book of Scripture, and the content of each is to some extent equivalent. At times it transpires that the book of Nature is even more universal and more comprehensible than the book of Scripture. Creation is before everyone's eyes, as a source for a moral and spiritual appeal.

c) The knowledge of the book of Nature seems to be relevant, and for some authors even necessary, to understanding correctly the book of Scripture, for the knowledge acquired by observing and studying natural things precedes the knowledge of God's revealed words¹⁹.

d) With regard to moral and ethical dimensions, there is a strong analogy between natural law (i.e. those moral commandments that are particular to human nature as such) and the revealed divine law. The first is written by God in the world of created beings and in human conscience, the second is written by the same God in the Scriptures.

3. Authors of the Middle Ages: the case of Hugh of St. Victor and St. Bonaventure

The metaphor of the Two Books also survives during the Middle Ages; with theology continuing to inquire about the relationship existing between them²⁰. References to the book of Nature can be found, with different nuances and to different degrees, among others, in St. Bernard of Clairvaux (1090-1153), Hugh of St. Victor (1096-1141), St. Bonaventure (1217-1274), St. Thomas Aquinas (1224-1274), Thomas of Chobham (about 1255-1327), Dante Alighieri (1265-1321), Thomas of

Kempis (1380-1471) and Raymond of Sebond (about 1385-1436), the subject of the next section.

In the Middle Ages, two authors deserve more room for discussion: Hugh of St. Victor and St. Bonaventure²¹. Both emphasize that the universal comprehension of the book of Nature is weakened by the reality of human sin. The book of Scripture exerts a kind of “healing action” over the book of Nature: after the original fall, and because of our sins, to recognize God in the spectacle of nature is not an easy task to accomplish. Thus a “third” book comes forth, the *book of the Cross*. Christ himself, his Incarnation and his redemption, is compared with a great book, whose reading is necessary to the proper understanding of the other two books. To this respect, Jesus Christ seems to play quite an interesting, twofold role. He acts indeed like a hinge between the Two Books. When considered as increased Wisdom, he shows a special relationship with the book of Scripture; when considered as the Incarnated Word, he is mainly associated to creation.

Hugh of St. Victor points out that to read the book of Nature properly, one needs to have a spiritual, not merely a natural (that is material) attitude: «For this whole visible world is a book written by the finger of God, that is, created by divine power; and the individual creatures are as figures in it, not derived by human will but instituted by divine authority to show forth the wisdom of the invisible things of God. But just as some illiterate man who sees an open book looks at the figures but does not recognize the letters: just so the foolish natural man who does not perceive what pertains to the Spirit of God [cf. 1Cor 2,14]. He sees the form and the beauty outside creatures without understanding their inner meaning. On the contrary, the spiritual person can judge everything, and when looking at the beauty of the works, he soon realizes how the Creator’s wisdom has to be much more admired»²². According to this mediaeval Master, God’s Wisdom is also a unique book, written inside (Holy Scripture) and outside (the works of creation). Nature is compared to a first scripture, the Bible to a second scripture. The Incarnation of the Word is a third scripture, which is seen as a book that also has an inner and an outer side, the first because of his invisible divinity, the second because of his visible humanity²³. All these images recall that book *written on both sides* which both the prophet Ezekiel and St. John’s Book of Revelation speak of²⁴. In a work titled *De Arca Noe Morali*, Hugh of St. Victor speaks of three books and of three words, but with a different meaning. The first book or word is all what is made by human activity; the second book/word is creation made by God; and the third book/word is Wisdom himself, that is the Increased Word. In this

case, Jesus Christ, as Incarnated Wisdom, plays the role of Sacred Scripture, of which he is the fulfilment²⁵.

In the works of St. Bonaventure, the metaphor of the Book is widely used, so that expressions such as *liber naturae*, *liber mundi*, or *liber creaturae*, are synonyms for nature, world, creation²⁶. At the same time, the necessity to know God through Sacred Scripture and not only through nature, and the demand for a third book, that of Christ Redeemer, is nevertheless explicit. Here are two outstanding texts: «Before sin, man had the knowledge of created things and through their images he was led to know God, to praise, to worship and to love him. The purpose for which living beings exist, is to lead us to God. When human beings fell because of sin, they lost such knowledge and so there was no one who could bring all things back to God. Thus this book, that is the world, seemed dead and destroyed. Therefore, there was a need for another book through which the previous book had to be enlightened, in order to acknowledge the true meaning of things. This book is nothing but Sacred Scripture, which contains metaphors, images and teachings about the book of the world. In this way, the book of Scripture restores the whole world, and allows the latter again to lead us to know, to praise and to love God»²⁷. «If we want to contemplate spiritual things, we need to take up the cross as if it were a book. [...] Christ himself is this book of wisdom, who is written inside by the Father, as he comes from the power of God, and outside, when he took on a bodily form. However, this book was open on the cross, and it is this book that we have to read in order to understand the depths of God's wisdom»²⁸.

Although these texts allow different interpretations, for instance whether it was our intellect to be mainly wounded by original sin, or our knowledge of God also weakened by our personal sins, the doctrine here underlying is clear enough. The book of Scripture and the book of the Cross have a kind of priority with respect to the book of Nature, at least regard to our ability to clearly recognize God. At the same time, St. Bonaventure cannot deny a chronological priority of the book of Nature over that of Scripture, as shown by this quote from the *Breviloquium*: «The first Principle is made known to us through Scriptures and creatures. By the book of Nature shows itself as the principle of power; by the book of Scripture as the principle of restoring. And since the restoring principle cannot be known without first knowing the principle of power, though the Bible tell us mainly about the work of redemption, it must also tell us about the work of creation». Despite the fact we are dealing here with a knowledge of nature *through* the pages of Scriptures, it is clear that such a knowledge calls for a comparison with the natural knowledge acquired by reason²⁹.

Other passages of the Franciscan Master recall the image of the book written both inside and outside, an image that works at different levels. All things are like a book written outside, insofar as we confine ourselves to read them as merely effects of God's power. Here is the step where natural philosophers seem to stop. Yet creatures are written inside, when we recognize them as traces or images (Lat. *vestigia*) of God. On a second level, material and irrational things are a book written outside, while rational and spiritual creatures, like humans and angels, are a book written inside, in the depth of their conscience. Finally, Scripture too turns out to be a twofold written book. The outer writings refer to those meanings of Scriptures which are explicit and clear, while inner writings represent those implicit senses and more obscure understandings³⁰.

The metaphor of the book is used by other mediaeval Masters, among them Thomas Aquinas. He seems to use it explicitly quite a few times, although it is difficult to pick out a complete set of quotes if our research is confined to expressions such as *liber naturae* or *liber creaturarum*, since the full context is always needed³¹. Nevertheless, it is worthwhile recalling that Aquinas provided a synthetic formulation of the relationship between the knowledge of God we acquire looking at nature, and the one we are taught by reading the Scriptures. With a sentence that will be quoted down through the centuries by many documents of the Church, he affirmed that human natural reason is able to reach a certain knowledge about spiritual realities, such as the existence of God, the immortality of the human soul, the existence of a moral responsibility before a provident Creator, etc.; however, God himself also wanted to reveal these same truths by the pages of the Holy Scripture, so that in this present condition of the human race, they can be readily known by all, with firm certitude and with no admixture of error³².

To summarize, we can say that the Middle Ages introduce a certain *theological realism* in the question of the Two Books. Human reason is able to read the book of Nature to ascend to God, but we have to take into account the wounds suffered by our intellect because of sin. This great Book continues to bind us to our Creator³³, but a spiritual and clear sight is required to recognize such a link³⁴. Authors of the Middle Ages do not lose optimism, but seem to gain realism. Actually we could say, by using the words of John Abbot of Ford (d. 1220), «Est enim liber creaturae et est liber scripturae et est liber gratiae — there is the book of creatures, the book of Scripture and the book of Grace»³⁵. The book of Nature does not lose its universality, but is framed within a strong christological perspective, and so demands other theological categories, such as Incarnation and redemption, fall and grace. Mediaeval Masters thus

extend the metaphor of the book to Christ and to God. God himself, according to the beautiful verses of Dante's *Comedia*, is the book, the volume, whose pages are scattered through the world, and which also allows Creation to be a book in itself: «In its depth I saw ingathered, bound by love in one single volume, that which is dispersed in leaves throughout the universe: substances and accidents and their relations, as though fused together in such a way that what I tell is but a simple light»³⁶.

4. The first Renaissance: the case of Raymond of Sebond

A work deserving a specific attention is the *Theologia Naturalis seu Liber Creaturarum* (1436), written by Raimundo de Sebunde (Raymond of Sebond, about 1385 - 1436), a Catalan born scholar, Doctor in Medicine and Theology, who was professor at Toulouse and president of that same University (1428-1435). The title of Sebond's treatise changes a bit depending on the manuscripts existing in different European Libraries: *Liber Naturae sive Creaturarum* (Paris), *Scientia Libri creaturarum seu Naturae et de Homine* (Toulouse), *Liber Creaturarum sive de Homine* (Clermond-Ferrand), etc. The subtitle *Theologia naturalis* was added by the publishers, starting from its second printing in 1485. This book was remarkably successful: it had sixteen editions and many translations, including a French one made by Michel de Montaigne in 1569. Until the beginning of the 18th century, various editors also re-arranged and re-organized the content of the book for different purposes³⁷.

The aim of the work is clear and explicit in the author's *Prologue*: the knowledge of the book of Nature allows us to understand, in a true and infallible way, and without much effort, all truths about created things, man and God. The book of Nature tells us all that is necessary for our perfection and moral fulfilment, so that, by reading this Book, we can achieve our eternal salvation. Moreover – Sebond adds – it is thanks to the knowledge of the book of Nature that we can understand without error what is contained in the book of Scripture³⁸. In the book of Nature each creature is nothing but a byte and a letter, written by the finger of God, such that all these letters and words together form a kind of manuscript, in which the human creature constitutes the most important word³⁹.

The relationship between the two Books is explained in detail but in a way that deviates, at least on some matters, from the teachings of the mediaeval Masters. Both books were given to us by the same and unique God; we received the first one from

the creation of the world, while the second one was written thereafter. The book of Nature seems to have a certain priority, for it is said that our knowledge of it precedes and confirms the book of Scripture; it is like a door to enter the Bible and a light to illuminate its words⁴⁰. The knowledge of the book of Nature is available to everyone, while the book of Scripture can be read only by the clerics. Nevertheless, the book of Scripture was inspired and written to help us read the book of creatures properly, since we were like the blind⁴¹ — a consideration that certainly refers to human sins and brings Sebond closer to the theologians of the Middle Ages. With an epistemological optimism that would have certainly amazed many contemporary philosophers of science, Sebond says that we cannot falsify or misinterpret the book of Nature, adding that, when studying it, there is no room for heretics or heresies. Contrary to Scripture, Nature cannot be deleted nor lost⁴². We need both books and they do not contradict each other. They do not differ in their content: all that is present in the first, we also find in the second. They differ with regard to the way in which such content is taught and proved: the book of Creatures teaches by means of a rational demonstration (*per modum probationis*), while the Holy Scriptures are based on God's authority and they teach us by means of prescriptions, commands and exhortations (*per modum praecepti, mandati, monitionis et exhortationis*)⁴³.

Raymond Sebond strives to keep his balance, but the matter is delicate and somewhat critical. The risk of over-evaluating the book of Nature at the expense of the sacred Scripture is real; one could think, for example, that all of what is contained in the Bible can be known simply looking at the creatures. It is true that he emphasizes in many places that the book of Scripture is “greater and higher” than that of Nature, because to speak with the authority of God is superior than demonstrating something by human reason: However, some of the arguments brought about by Sebond are precarious, and at times ambiguous. Trying to summarize his thought, we could say that from a cognitive point of view, the book of Nature is primary and more fundamental: its knowledge is more universal and con-natural to us, that is tailor-made for the human mind⁴⁴; from the point of view of dignity, the book of Scripture has a higher value, because of the authority on which words contained therein are based⁴⁵. Yet, the priority of Nature serves the Scriptures, because it is directed to the knowledge of the latter: thus all matter is counterbalanced once again, and Sebond finds his way once more⁴⁶.

It is no surprise that the doctrine of the *Liber Creaturarum* was interpreted and judged in different and sometimes contrasting ways. Some scholars saw in it the danger of reducing the significance of Scripture and weakening the authority of the

Church to interpret it. Others saw in the work of Raymond Sebond a nice example of natural theology, in tune with the Christian philosophy of the Early Centuries and the Middle Ages⁴⁷. It was because of the implicit problems it contained that in 1559 the book was included by Pope Paul IV into the Index of the forbidden books. But a few years later, in 1564, Pope Pius IV limited the prohibition to the *Prologue* only, asking that a note of theological clarification be inserted in all the later publications of the book.

Beyond the course of events and opinions related to the work of Sebond, there is no doubt that the content of the *Liber Creaturarum* differs somewhat from the theological perspective held during the Middle Ages. For the first time — and probably beyond the intentions of its author — we find an attempt to read a *moral* doctrine in Nature in such a way that, in principle, the consideration of the sacred Scriptures *could be left out*. Now the book of Nature can be seen as a book autonomous in itself. It is probably from this point, I guess, that the road is open for a “modern religion of nature” capable of conveying moral and spiritual values without a necessary reference to the revealed religion based on the Bible. This will give rise at least to a couple of philosophical lines of thought.

The first is a kind of “lay sacralization” of Nature (we mean here something very different from those other sacred views of Nature, utterly Christian in character, highlighted by Scotus Eriugena, the Celtic Christianity, Hildegard of Bingen or Franciscus of Assisi). A new natural lay religion emerges, having its own rites, prayers and moral prescriptions, which can easily and dangerously meet the practice of magic and esoteric customs. It will coalesce in the Renaissance, giving rise to a pseudo-philosophy which lasts until our days through some of the manifold expressions of the New Age. The second line of thought is that related to the Deism of the Enlightenment, a religion of reason and nature which leaves aside, and often criticizes, all the *revealed* religions. The latter were considered as controversial, that is sources of intolerance and division, while a natural religion based on reason was, in the program of the Enlightenment, the only one capable of re-uniting in a peaceful way all humankind.

Notwithstanding the fact that the work of Raymond of Sebond could have nourished these philosophical roots, the ideas there contained deserve to be studied in more depth. His proposal possesses interesting suggestions that might help the development of the contemporary dialogue between Religion and Science, provided

that the relationship between the two Books is explained in a slightly more convincing way than that of Sebond.

5. At the dawn of Science of the Modern Age: who can read the book of Nature?

The transition to the Renaissance is, for our topic, particularly critical⁴⁸. The Patristic Age and the Middle Ages do not know the idea of a dialectic opposition between the Two Books, as if their mutual comparison were a question to be solved. Authors are not concerned about showing or demonstrating their “harmony”, in the contemporary meaning of the word. Rather, they want to show their common dignity as divine revelation and their role to provide mankind with a true knowledge of the unique God. In light of a human history characterized by fall and redemption, their mutual gnoseological relationship (or subordination) is also determined and explained with different emphases, especially within a christological perspective. The two Books are discussed and compared without any need for healing or rectifying any conflict. A number of authors in the 15th and 16th centuries will continue to maintain that creatures are the words or the book of God, using this metaphor for rhetoric or spiritual purposes, as Nicholas of Cusa (1401-1464), Martin Luther (1483-1546) or Fray Luis of Granada (1504-1588), but far from any problem of clashing interests⁴⁹.

In contrast it is the line of thought emphasized by Philippus Paracelsus (1493-1541) which gives rise to a different state of affairs. Following a peculiar interpretation of the work of Raymond of Sebond, the book of Nature now begins to permit a reading which seems to enter into conflict with the Holy Scripture. More than a conflict of contents, it seems to be a conflict of *readers* and *languages*. Against theologians and those scholars who based their studies on the Bible, Paracelsus affirms: «From the light of Nature must enlightenment come, that the text *liber naturae* be understood, without which enlightenment no philosopher nor natural scientist may be». And one of his students will add: «Let the others read their compendiums, while we study in the great picture book which God has opened for us outdoors»⁵⁰. The development of natural studies and experimental observations carried out in the late Renaissance introduced the idea that we can approach the world of the divine without the mediation of sacred Scripture, of theology or scholastic philosophy, and of course without the mediation of any Church. What is at stake is not the existence of God nor the choice of what is the best source (Nature or Scripture) to understand who we are and where are we going. In fact, for the Renaissance scientists it remains clear that God himself wrote the book of Nature. The point is that now they

can read it directly, praising and worshipping the Architect and the Maker of the world. The accordance between natural philosophy and theology, between Nature and Scripture, between natural and revealed moral laws, an accord that was centered for a long time around the mystery of the two, human and divine, natures of the Incarnated Logos, is bound to be broken. A “spiritual” reading of the book of Nature is still possible, but it is no longer *Christian*, as will be shown later on by the philosophy of Deism and the spirit of Romanticism. Born in a Christian context, the concept of the world as a book now becomes secularized and alienated from its theological origin.

The discussion of the position held by Galileo Galilei (1564-1642) in such historical process is beyond the aims of present paper⁵¹. However, I want to make a couple of comments, because he uses the metaphor in a way that contributes to reducing the number of those who are allowed to read the book of the universe. It is true that, in contrast to Paracelsus and to what the deists will later maintain, for Galileo the Author of the Two Books is undoubtedly the unique God of the Judaeo-Christian Revelation, for «the Holy Scripture and Nature equally proceed from the divine Word, the former as the dictation of the Holy Ghost and the latter as most observant executrix of God’s command»⁵², according to the well known *Letter to Castelli* (1613). Nevertheless it is clear that «the great book of Nature — as he wrote in the foreword of the *Dialogue on the two Chief World Systems* (1632) — is the proper object of natural philosophy»⁵³, and that the reading of the book of Nature is matter for scientists, not for theologians.

The famous page of the *Assayer* (1923) should be read, in my opinion, precisely in that light: «Philosophy is written in this grand book, the universe, which stands continually open to our gaze. But the book cannot be understood unless one first learns to comprehend the language and read the letters in which it is composed. It is written in the language of mathematics, and its characters are triangles, circles and others geometric figures without which it is humanly impossible to understand a single word of it; without these, one wanders about in a dark labyrinth»⁵⁴. In 1641, in a letter addressed to Fortunio Liceti, the metaphor is clearly used against the cultural establishment of his time, whose books have now been surpassed, because «the book of philosophy is now that which stands perpetually open before our eyes; but because it is written in characters different from those of our alphabet, it cannot be read by everybody; and the characters of this book are triangles, squares, circles, spheres, cones, pyramids and other mathematical figures fittest for this sort of reading»⁵⁵. It is worthwhile pointing out that since the epoch of the early Fathers of the Church, the meaning of the metaphor is now surprisingly overturned. If St. Augustine could state

that «everyone, even the illiterate, can read the book of the universe», in Galileo's view people who are qualified to read it belong to a much narrower circle. Raymond of Sebond's proposition that the knowledge of the book of Nature is common to everyone, while the book of Scripture can be read only by the clerics, finds its mirror image here, but at the expense of the universality of the book of the world.

The position maintained by Johannes Kepler (1571-1630) seems, in this respect, a bit different. For the German astronomer too the book of Nature required a rational interpretation, but he was able to clothe his rationality with a mantle of mysticism and spirituality. Astronomers are the high priests of the Most High God and the universe is precisely their book. But its content is more than mere geometry or mathematics, since it can be used like a Missal to celebrate, pray and worship God Creator. Like Galileo, also Kepler holds that Nature is a book for scientists, not for theologians, but without giving it a solely "rationalistic" reading, according to the contemporary meaning we now give to this term⁵⁶. The book of the universe is also suitable for praying and worshipping, and so it recovers part of its universality⁵⁷. The astronomer is not forbidden from becoming a theologian.

Thus, having these different and somewhat contradictory nuances, the metaphor of the Two Books will enter into the Modern Age. With regard to the book of Nature, the "rationalistic" and the "spiritual" ways of reading it will survive until today, but in a new religious context, one that will also oblige scholars to distinguish carefully between the different ways in which the Bible must be read.

6. Reading Nature as a Book. Consequences for the study of theologians and the research of scientists: some philosophical perspectives

Returning to the philosophical core of the image of the Two Books, and particularly to that of Nature as a book, does the meaning of such image entail any consequences for the work of theologians and scientists? The issue is broad, but it is worthy to be explored, at least in a schematic way.

On the side of theology, I begin by mentioning that in line with the Fathers of the Church and the other authors I reported above, in our time also the teachings of John Paul II employ the metaphor of Nature as a book⁵⁸. In the Encyclical *Fides et ratio* (1998), commenting on a passage of the Book of Wisdom that speaks of the knowledge of God, by analogy, from his works⁵⁹, John Paul II states: «This is to

recognize as a first stage of divine Revelation the marvellous “book of nature”, which, when read, with the proper tools of human reason, can lead to knowledge of the Creator» (n. 19). Some years later, taking the cue from the commentary to Psalm 18, he will say: «For those who have attentive ears and open eyes, creation is like a first revelation that has its own eloquent language: it is almost another sacred book whose letters are represented by the multitude of created things present in the universe»⁶⁰.

Thus, it is permissible, from a theological point of view, to present the material universe as part of God’s revelation. Until now, the magisterium of the Catholic Church preferred to reserve the term “Revelation” only to refer to historical-supernatural word of God. For instance, in the documents of the First (1870) and Second (1965) Vatican Councils, when speaking of “creation” or “nature” other attributes were used, such as “testimony”, “witnessing” or “manifestation” of God⁶¹. Conversely, the concept of revelation will be used in the context of creation by the Catechism of the Catholic Church (1992, 1997²) and in other speeches by John Paul II⁶².

If creation can be said to be a Book which reveals something of God, then it must have the capacity to appeal, to bear meaning, to incarnate an end. Human beings must not limit the experience they have of creation to the aesthetic level, but must ask themselves about the Author of beauty⁶³. A book, as a written text, contains a message and is addressed to someone; and it does it more explicitly than the simple view of a landscape. The theological basis to consider creation as the initial stage of divine Revelation depends on its direct relationship with the Word-Logos, through Whom all things were made, and on that Christological dimension which permeates the created world as a whole, a world made through Him and for Him⁶⁴.

Remarkable consequences can also be seen in the important field of the inter-religious dialogue. If the book of Nature is in front of everyone and it manifests the revelation of the true God, then on the basis of this common acknowledgement a meaningful dialogue can start, provided that the simply aesthetic dimension is complemented with a reliable philosophical framework which is respectful of all the requirements of human rationality. With regard to those who have not received any historical revelation of God, the “word of creation” can play the role of a truly salvific revelation, in the place of Scriptures or other kinds of spiritual mediation. It must be pointed out, however, that Nature *alone* does not save anyone. The capability of creation to awaken and convert human hearts to the love of the Creator, closely

depends on the link existing between the natural world and the salvific humanity of Christ, the center and the scope of all of creation⁶⁵.

Finally, if theology is invited to open again the “Book of Nature” — a book that some suggested *closing* because it was too difficult to read, or because after Galileo and Darwin it became a source of trouble — it means that the result of natural sciences can be considered a source of positive speculation, so that they can truly help theology to better understand the word of God⁶⁶.

When seen from the point of view of the activity of scientists, the metaphor of the “book” can be easily connected with the idea of an intelligible and rational universe, fit to be “read” by experiments as well as by theories. The question of the ultimate reason for the intelligibility of the world is indeed present in the contemporary interdisciplinary debate, and many authors have pointed out that such interrogation remains meaningful⁶⁷. To believe that the natural world has the *logic* of a book, ordered and non-chaotic, written by God and containing a rational message, could influence the “spirit” with which a scientist carries out his or her activity. The following quote by Georges Lemaître seems, in this respect, quite impressive: «Both of them, (the believing scientist and the non-believing scientist) endeavour to decipher the palimpsest of nature, in which the traces of the various stages of the long evolution of the world are overlaid on one another and confused. The believer has perhaps the advantage of knowing that the enigma has a solution, that the underlying writing is, when all is said and done, the work of an intelligent being, therefore that the problem raised by nature has been raised in order to be solved, and that its difficulty is doubtless proportionate to the present or future capacity of mankind. That will not give him, perhaps, new resources in his investigation, but it will contribute to maintaining in him a healthy optimism without which a sustained effort cannot be kept up for long»⁶⁸.

There are scientists who speak of their research activity as a sort of “dialogue” between themselves and nature, and of their discoveries as an experience of “revelation”. According to John Polkinghorne, «Physicists laboriously master mathematical techniques because experience has shown that they provide the best, indeed the only, way to understand the physical world. We choose that language because it is the one that is being “spoken” to us by the cosmos»⁶⁹. Nature is understood as a mystic, appealing partner that appears before the scientist: «Sometimes, through a strong, compelling experience of mystical insight, a man knows beyond the shadow of doubt that he has been in touch with a reality that lies

behind mere phenomena. He himself is completely convinced, but he cannot communicate the certainty. It is a private revelation»⁷⁰. Beyond the words employed to describe such feelings, these experiences are consistent, once again, with the idea that the world can be read, that it conveys a message, that the universe reveals a sort of “cosmic code” — an expression that has become common in popular science. In conclusion, Nature seems to continue to be seen as a Book, despite the passing of the centuries and the change of philosophical paradigms.

At the beginning of this paper we mentioned that one of the most solemn visions described in St. John’s *Book of Revelation* shows the Lamb who receives from the throne of the Most High a book, the seals of which only he is worthy to open. In this vision, the opening of the scroll is praised not only by peoples of every tongue and nations, but also by all living beings: «Then I heard every creature in heaven and on earth and under the earth and in the sea, everything in the universe, cry out: “To the one who sits on the throne and to the Lamb be blessing and honor, glory and might, forever and ever”»⁷¹. In other words, the book of all history, of which the Lamb is judge and redeemer, and the book of all natural creation, seem to be summarized and contained in that unique Book, the seals of which only the Incarnate Word is worthy of breaking. The Book of History and the Book of Nature belong to the same Book, of which the Incarnated Logos is the first and last word, the beginning and end, the alpha and the omega⁷².

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¹ For the historical perspective, see: D.C. LINDBERG, R.L. NUMBERS (eds.), *God and nature. Historical essays on the encounter between Christianity and science* (Berkeley - London: Univ. of California Press, 1986); J. BROOKE, *Science and Religion: Some Historical Perspectives* (Cambridge: Cambridge University Press, 1991); J.J. CLARKE (ed.), *Nature in Question. An Anthology of Ideas and Arguments* (London: Earthscan, 1993); A.C. CROMBIE, *Styles of Scientific Thinking in the European Tradition*, 3 vols. (London: Duckworth, 1994).

² «He commands the sun, and it rises not; he seals up the stars. He alone stretches out the heavens and treads upon the crests of the sea. He made the Bear and Orion, the Pleiades and the constellations of the south» (Jb 9,7-9). «I Bless the Lord, my soul! Lord, my God, you are great indeed! You are clothed with majesty and glory, obed in light as with a cloak. You spread out the heavens like a tent; you raised your palace upon the waters. You make the clouds your chariot; you travel on the wings of the wind. You make the winds your messengers; flaming fire, your ministers» (Ps 104,1-4). «It was I who made the earth and created mankind upon it; It was my hands that stretched out the heavens; I gave the order to all their host» (Is 45,12). «He who made the earth by his power, established the world by his wisdom, and stretched out the heavens by his skill» (Jer 10,12=51,15). Cf. also Is 44,24; Is 51,13; Zec 12,1. A different verb, but having an analogous meaning, is that offered by Is 48,13: «Yes, my hand laid the foundations of the earth; my right hand spread out (Heb. *piel*) the heavens. When I call them, they stand forth at once».

³ Cf. G.J. BOTTERWECK, H. RINGGREN, H.J. FABRY, *Theological Dictionary of the Old Testament* (Grand Rapids (MI) - Cambridge (UK): Eerdmans, 1998), vol. IX, pp. 381-387.

⁴ Reported by Socrates Scholasticus, *Historia Ecclesiastica*, IV, 23 (PG 67, 518).

⁵ «Nature was the first book God gave to us, rational beings; ink-written teachings were given after human transgression» (ISAAC OF NINEVEH, *Sermones ascetici*, V).

⁶ See, for example, ST. ATHANASIUS, *Expositio in Psalmum XVII*, n. 4 (PG 27, 124C); ST. JOHN CHRYSOSTOMUS, *Homilia ad populum antiochenum*, IX, 2 (PG 49, 105).

⁷ *Homilia de gratiarum actione*, 2 (PG 31, 221C - 224A)

⁸ «Liber tibi sit pagina divina, ut haec audias; liber tibi sit orbis terrarum, ut haec videas. In istis codicibus non ea legunt, nisi qui litteras noverunt; in toto mundo legat et idiotas» (*Enarrationes in Psalmos* 45, 7 (PL 36, 518)).

⁹ «Alius, ut inveniatur deum, librum legit. Est quidam magnus liber ipsa species creaturae: superiorem et inferiorem contuere, attende, lege. Non deus, unde eum cognosceres, de atramento litteras fecit: ante oculos tuos posuit haec ipsa quae fecit. Quid quaeris maiorem vocem?» (*Sermones*, 68, 6 (PLS 2, 505)).

¹⁰ «For heaven shall be folded up like a scroll; and now is it stretched over us like a skin. For your Divine Scripture is of more eminent authority, since those mortals by whom Thou dispenses it unto us, underwent mortality. And you know, Lord, you know, how you with skins did clothe men, when they by sin became mortal. Whence you have like a skin stretched out the firmament of your book, that is, your harmonizing words, by the ministry of mortal men — Caelum enim plicabitur ut liber et nunc sicut pellis extenditur super nos. Sublimioris enim auctoritatis est tua divina Scriptura, cum iam obierunt istam mortem illi mortales, per quos eam dispensasti nobis. Et tu scis, Domine, tu scis quemadmodum pellibus indueris homines, cum peccato mortalis fierent. Unde sicut pellem extendisti firmamentum libri tui, concordet utique sermones tuos, quos per mortaliu ministerium superposuisti nobis» (*Confessiones*, XIII, 15, 16).

On the moral value of the book of Nature see also *Reply to Faustus the Manichaeon*: «But had you begun with looking at the book of nature as the production of the Creator of all, and had you believed that your own finite understanding might be at fault wherever anything seemed to be amiss, instead of venturing to find fault with the works of God, you would not have been led into these impious follies and blasphemous fancies with which, in your ignorance of what evil really is, you heap all evils upon God — At si universam creaturam ita prius aspiceres, ut auctori Deo tribueres, quasi legens magnum quendam librum naturae rerum atque ita si quid tibi te offenderet, causam te tamquam hominem latere posse tutius credere quam in operibus Dei quicquam reprehendere auderes, numquam incidisses in sacrilegas nugas et blasphema figmenta, quibus non intellegens, unde sit malum, Deum implere conaris omnibus malis» (*Contra Faustum*, XXXII, 20).

¹¹ «Neque enim novimus alios libros ita destruentes superbiam, ita destruentes inimicum et defensorem resistentem reconciliationi tuae defendendo peccata sua» (*Confessiones*, XIII, 15, 17)

¹² «Let them praise your name, let them praise you, the supercelestial people, your angels, who have no need to gaze up at this firmament, nor to read it to know your Word. For they always behold your face, and there read without any syllables in time, what will your eternal will [...]. Their book is never closed, nor their scroll folded up; you are indeed their book, and you are this to them eternally — Laudent nomen tuum, laudent te supercaelestes populi angelorum tuorum, qui non opus habent suspicere firmamentum hoc et legendo cognoscere verbum tuum. Vident enim faciem tuam semper et ibi legunt sine syllabis temporum, quid velit aeterna voluntas tua [...]. Non clauditur codex eorum nec plicatur liber eorum, quia tu ipse illis hoc es et es in aeternum» (*ibidem*, XIII, 15, 18)

¹³ «In the sacred Scriptures the Word is veiled as Logos; in the created world, He is veiled as Maker and Creator. Thus I state that both are needed by he who wants to turn to God judiciously. He needs the spiritual reading of Scripture and the spiritual contemplation of natural creatures. And so the natural law and the written law have the same dignity and teach the same things, in a way that one of them has nothing more, nothing less than the other» (*Ambigua*, 10 (PG 91, 1128 C)).

¹⁴ *Ambigua*, 10 (PG 91, 1129 A).

¹⁵ See on this author J. SCOTUS ERIUGENA, *The voice of the Eagle. The Heart of Celtic Christianity* (Great Barrington (MA): Lindisfarne Books, 2000)

¹⁶ «Nam et Abraham non per literas scripturae, quae nondum confecta fuerat, verum conversione siderum Deum cognovit». (cfr. *De divisione naturae*, PL 122, 723-724)

¹⁷ «Dupliciter ergo lux aeterna seipsam mundo declarat, pre Scripturam videlicet et creaturam. Non enim aliter in nobis divina cognitio renovatur, nisi per divinae scripturae apices et creaturae species. Eloquia disce divina, et in animo tuo eorum concipe intellectum, in quo cognosces Verbum. Sensus corporeo formas ac pulchritudines rerum perspice sensibilibus, et in eis intelligens Dei Verbum. Et in his omnibus nichil aliud tibi veritas declarabit praeter ipsum qui fecit omnia, extra quem nichil contemplaturus es, quia ipse est omnia» (*Homilia in prologum S. Evangelii secundum Johannem*, ch. XI (SC 151, 254)).

¹⁸ Cf. *Book of Wisdom*, 13,1-9; *Epistle to Romans*, 1,18-20; *Acts of the Apostles*, 14,13-18 and 17,22-27. It must be emphasized that such a philosophical path does not necessarily rely on a strong metaphysical apparatus, as it will do, for instance, in mediaeval theology. The Fathers of the Church appeal to common sense, to the notion of Providence, to aesthetical and moral arguments. In addition, the *cosmological* path is often associated with the *anthropological* path, that is, they appeal to the capability the pagans had to recognize God in moral imperatives of conscience and in the human search for happiness and love.

¹⁹ This doctrine is openly affirmed by, among others, St. Basil: «Which is first: knowledge or faith? We say that, on the whole, in the case of sciences, faith precedes knowledge, but in our teaching, even if anyone says that knowledge begins before faith, we do not disagree — but, a knowledge commensurate with human comprehension. In the case of sciences, we must believe first that alpha is so called, and afterwards, having learned the letters and their pronunciation, gain also an accurate notion of the force of the letter. But in our faith

concerning God the thought that God exists goes before, and this we gather from His works. We recognize by observation His wisdom and power and goodness and all His invisible attributes from the creation of the world» (*Epistula*, 235, 1 (PG 32, 872B)). On the same subject, Tertullian: «We state that first we know God through nature and after we recognize Him in the doctrines. Knowledge through nature comes from His works; knowledge through doctrines, from preaching. — Nos definimus, Deus primo natura cognoscendum, deinde doctrina recognoscendum: natura ex operibus; doctrina ex praedicationibus» (*Adversus Marcionem*, I, 18 (PL 2, 266)).

It is worthwhile noting that the same teaching is recalled, using similar words, by John Paul II's Encyclical *Fides et ratio*: «The Acts of the Apostles provides evidence that Christian proclamation was engaged from the very first with the philosophical currents of the time. In Athens, we read, Saint Paul entered into discussion with “certain Epicurean and Stoic philosophers” (17,18); and exegetical analysis of his speech at the Areopagus has revealed frequent allusions to popular beliefs deriving for the most part from Stoicism. This is by no means accidental. If pagans were to understand them, the first Christians could not refer only to “Moses and the prophets” when they spoke. They also had to point to the natural knowledge of God and to the voice of conscience in every human being (cf. Rom 1,19-21; 2,14-15; Acts 14,6-17)» (n. 36).

²⁰ The consideration of the Islamic tradition is beyond my analysis. However, an overall look at the content of the Koran shows that the term “book” never refers explicitly to nature, but is always used to indicate the same Koran and its laws, that are seen as the book *par excellence*. Some Islamic authors have noted that the Koranic verses are called *ayat* (“signs”), as are the phenomena of nature, indicating that the Koran could be seen as the counterpart of a natural text translated into human words. Cf. S.H. NASR, *Religion and the Order of Nature* (New York: Oxford Univ. Press, 1996). An indirect reference to the difference between Christian and Islamic traditions is made by the *Catechism of the Catholic Church*, n. 108.

²¹ For the Middle Ages, see J.M. GELLRICH, *The Idea of the Book in the Middle Age* (Ithaca - London: Cornell University Press, 1985).

²² «Universis enim mundus iste sensibilis quasi quidam liber est scriptus digito Dei, hoc est virtute divina creatus, et singulae creaturae quasi figurae quaedam sunt non humano placito inventae sed divino arbitrio institutae ad manifestandum invisibilium Dei sapientiam. Quemadmodum autem si illiteratus quis apertum librum videat, figuras aspicit, litteras non cognoscit: ita stultus et animalis homo qui non percipit ea quae Dei sunt [cf. 1Cor 2,14] in visibilibus istis creaturis foris videt speciem sed intus non intelligit rationem. Qui autem spiritualis est et omnia dijudicare postest, in eo quidem quod foris considerat pulchritudinem operis, intus concipit quam miranda sit sapientia Creatoris» (*Eruditiones Didascalicae*, Book VII, ch. 4 (PL 176, 814B)).

²³ «Sapientia liber erat scriptus intus, opus sapientiae liber erat scriptus foris. Voluit autem postea adhuc, aliter scribi foris sapientiam ut manifestius videretur et perfectius cognosceretur, ut oculus hominis illuminaretur ad scripturam secundam, quoniam caligaverat ad primam. Fecit ergo secundum opus post primum et illud evidentius erat, quoniam non solum demonstravit sed illuminavit. Assumpsit carnem non amittens divinitatem, et positus est liber scriptus intus et foris; in humanitate foris, intus in divinitate, ut foris legeretur per imitationem, intus per contemplationem; foris ad sanitatem, intus ad felicitatem; foris ad meritum, intus ad gaudium. [...] Liber ergo unus erat semel intus scriptus, et bis foris. Foris primo per visibilibus conditionem, secundo foris per carnis assumptionem. Primo ad jucunditatem, secundo ad sanitatem; primo ad naturam, secundo contra culpam; primo ut natura foveretur, secundo ut vitium sanaretur, et natura beatificaretur» (*De sacramentis*, Book I, Pars VI, ch. 5 (PL 176, 266-267)).

²⁴ Cf. *Book of Ezekiel*, 2,9-10; *Book of Revelation*, 5,1.

²⁵ «Tres sunt libri. Primus est quem facit homo de aliquo; secundus, quem creavit Deus de nihilo; tertius quem Deus genuit Deum de se Deo. Primus est opus hominis corruptibile; secundus est opus Dei, quod nunquam desinit esse, in quo opere visibili invisibilis sapientia Creatoris visibiliter scripta est; tertius est non opus Dei, sed sapientia, per quam fecit omnia opera sua Deus, quam genuit non fecit, in qua ab aeterno cuncta, quae facturus erat, secundum sententiam providentiae et praedestinationis praescripta habuit. Et hic est liber vitae, in quo quidquid semel scriptum fuerit, numquam abolebitur, et omnes, qui meruerint pervenire usque ad ejus inspectionem, vivent in aeternum» (*De Arca Noe Morali*, Book III, ch. XII: *De tribus libris* (PL 176, 643-

644)). «Item tria sunt verba. Primum est verbum hominis, quod prolatum desinit; secundum est verbum Dei, id est opus Dei, quod creatum non invariabiliter subsistit, nec tamen aliquando desinit; tertium est verbum Dei, quod genitum, non creatum, finem et principium nescit, neque ullam mutabilitatem recipit, et hoc est, verbum vitae» (*ibidem*, Book III, ch. XIII: *De tribus verbis* (PL 176, 643-644)).

²⁶ See, for instance, *Itinerarium mentis in Deum*, I, 14.

²⁷ «Certum est quod homo stans habebat cognitionem rerum creaturarum et per illarum repraesentationem ferebatur in Deum ad ipsum laudandum, venerandum, amandum; et ad hoc sunt creaturae et sic reducuntur in Deum. Cadente autem lumine, cum amississet cognitionem, non erat qui reduceret eas in Deum. Unde iste liber, scilicet mundus, quasi emortuus et deletus erat; necessarius autem fuit alius liber, per quem iste illuminaretur, ut acciperet metaphoras rerum. Hic autem liber est Scripturae, qui ponit similitudines, proprietates et metaphoras rerum in libro mundi scripturarum. Liber ergo Scripturae reparativus est totius mundi ad Deum cognoscendum, laudandum, amandum» (*Collationes in Hexämeron*, XIII, 12).

²⁸ «Si volumus spiritualia contemplari, oportet tollere crucem ut *librum*; quo erudiamur; de quo libro in Deuteronomio: *Tollite librum istum et ponite eum in laterae arcae foederis Domini* [cf. Dt 31,26]. *Arca foederis Domini* est beata Virgo, in qua omnia arcana sunt recondita. *Liber* sapientiae est Christus, qui scriptus est *intus* apud Patrem, cum sit ars omnipotentis Dei; et *foris*, quando carnem assumpsit. Iste liber non est apertus nisi in cruce; istum librum debemus tollere, ut intellegamus arcana sapientiae Dei» (*Sermones de Tempore, Feria VI in Parasceve*, sermo II, n. II).

²⁹ «Cum primum principium reddat se nobis cognoscibile et per Scripturam et per creaturam, per librum creaturae se manifestat ut principium effectivum, per librum Scripturae ut principium reparativum; et quia principium reparativum non potest cognosci, nisi cognoscatur et effectivum: ideo sacra Scriptura, licet principaliter agat de operibus reparationis, agere nihilominus debet de opere conditionis, in quantum tamen ducit in cognitionem primi principii efficientis et reficientis» *Breviloquium*, Pars II, ch. 5).

³⁰ Cf. *Collationes in Hexämeron*, XII; cf. also *Breviloquium*, ch. XII.

³¹ Explicit references can be found in *Super Epistolam ad Romanos*, ch. I, lect. 6 and in two other works, whose authenticity remain dubious: *Expositio in Apocalypsim*, ch. 3 and *Sermo V de Dominica secunda de Adventu*.

³² «It was necessary for the salvation of man that certain truths which exceed human reason should be made known to him by divine revelation. Even as regards those truths about God which human reason could have discovered, it was necessary that man should be taught by a divine revelation; because the truth about God such as reason could discover, would only be known by a few, and that after a long time, and with the admixture of many errors. Whereas man's whole salvation, which is in God, depends upon the knowledge of this truth. Therefore, in order that the salvation of men might be brought about more fitly and more surely, it was necessary that they should be taught divine truths by divine revelation. It was therefore necessary that besides philosophical science built up by reason, there should be a sacred science learned through revelation» (Thomas Aquinas, *Summa Theologiae*, I, q. 1, a. 1). This doctrine is recalled by the First and by the Second Vatican Council (cf. *Dei Filius*, DH 3005 and *Dei Verbum*, 6).

³³ «Invisibilia Dei, apostolo teste, a creatura mundi per ea quae facta sunt intellecta conspiciuntur, et est velut communis quidam liber et catena ligatus sensibilis mundus iste, ut in eo sapientiam Dei legat quicumque voluerit» (St. Bernard of Clairvaux, *Sermones, De Diversis*, IX, 1). «Totus enim mundus diversis creaturis plenus est; quasi liber scriptus variis litteris et sentiis plenus in quo legere possumus quicquid imitari vel fugere debeamus» (Thomas of Chobham, *Summa de arte praedicandi*, ch. 7).

³⁴ «Si rectum cor tuum esset, tunc ommis creatura speculum vitae et liber sacrae doctrinae esset — If thine heart were right, then every creature should be to thee a mirror of life and a book of holy doctrine» (*Imitatio Christi*, II, 4).

³⁵ John Abbot of Ford, *Super extremam partem Cantici canticorum sermones*, Sermo 104, 1.

³⁶ «Nel suo profondo vidi che s'interna / legato con amore in un volume / ciò che per l'universo si squaderna: / sustanze e accidenti e lor costume / quasi conflati insieme, per tal modo / che ciò ch'io dico è un semplice lume» (*Commedia*, Paradise, XXXIII, 85-90).

«At the end of the poem, the pilgrim's vision of the whole cosmos as a volume whose leaves are scattered through the layers of the material world merely confirms both Dante's notion that creation is a book and his imaginative impulse of conflating and reconstructing into a unity the rich, unfolding variety of creation» (G. Mazzotta, *Dante's Vision and the Circle of Knowledge* (Princeton (NJ): Princeton University Press, 1993), p. 18). We have enough reasons to infer that the word "volume" here means "book", and not merely "space". Other parallel pages of the *Comedia* present a volume as what is composed of various "quires" or "sheets" (cf. Paradise, II, 76 and XII, 121). For a philological introduction to Dante's *Comedia*, see C. SINGLETON, *Commedia. Elements of Structure* (Cambridge (MA): Harvard University Press, 1957).

³⁷ Cf. M. DE MONTAIGNE, *An Apology for Raymond Sebond*, edited by M.A. Screech, Penguin Books, London 1987. On this Author see also J. DE PUIG, *Les sources de la pensée philosophique de Raimond Sebond* (Ramon Sibiuda), H. Champion, Paris 1994.

³⁸ «Ista scientia docet omnem hominem cognoscere realiter, infallibiliter, sine difficultate et labore omnem veritatem necessariam, homini cognoscere, tam de homine, quam de Deo, et omnia, quae sunt necessaria homini ad salutem et ad suam perfectionem, et ut perveniat ad vitam aeternam.

Et per istam scientiam homo cognoscet sine difficultate infallibiliter, quidquid continetur in sacra Scriptura. Et quidquid in sacra Scriptura dicitur et praecipitur, per hanc scientiam cognoscitur infallibiliter cum magna certitudine [...]» (*Theologia naturalis seu Liber creaturarum*, fac-simile of 1852 publication at Sulzbach (Stuttgart-Bad Cannstatt: F. Frommann Verlag, 1966), *Prologus*, pp. 27*-28*).

³⁹ «[...] quaelibet creatura non est nisi quaedam littera, digito Dei scripta; et ex pluribus creaturis, sicut ex pluribus litteris, est compositus liber unus, qui vocatur liber creaturarum. In quo libro etiam continetur ipse homo, et est principaliter littera ipsius libri» (*ibidem*, pp. 35*-36*).

⁴⁰ «Et ideo liber creaturarum est porta, janua, introductorium and lumen quoddam ad librum sacrae Scripturae, in quo sunt verba Dei; et ideo ille praesupponit iste» (*Titulus CCXI*, p. 311).

⁴¹ «[Liber] Scripturae datus est homini secundo; et hoc in defectu primi libri, eo quia homo nesciebat legere in primo, eo quia erat caecus. Sed tamen primus liber, creaturarum, est omnibus communis; sed liber Scripturae non est omnibus communis, quia solum clerici sciunt legere in eo» (*Prologus*, p. 36*). The reference to the original sin becomes more explicit by the end of the *Prologue*: «Quam quidem sapientiam nullus potest videre nec legere per se in dicto libro semper aperto nisi sit a Deo illuminatus et a peccato originali mundatus» (*Prologus*, p. 38*).

⁴² «Primus liber, naturae, non potest falsificari, nec deleri, nec false interpretari. Ideo, haeretici non possunt eum false intelligere; neque aliquis potest fieri in eo haereticus. Sed secundus potest falsificari et false interpretari et male intelligi» (*ibidem*, pp. 36*-37*).

⁴³ Cf. *Titulus CCXII*, pp. 314-315.

⁴⁴ «Et ideo conveniunt ad invicem, et unus non contradicit alteri. Sed tamen primus est nobis connaturalis, secundus supernaturalis» (*Prologus*, p. 37*).

⁴⁵ Cf. *Titulus CCXV*, pp. 322-324.

⁴⁶ «Et sic apparet summa concordia, summa consonantia, et summa convenientia inter librum Sacrae Scripturae et librum creaturarum; et quod liber creaturarum servit et famulatur libro Sacrae Scripturae quasi imperanti, mandanti et praecipienti, et apparet, quod non differunt nisi in modo dicendi et loquendi; quia unus loquitur per modum probationis, et alter per modum praecepti et auctoritatis» (*Titulus CCXII*, p. 315).

⁴⁷ The *Liber Creaturarum* was known and appreciated, among the others, by Nicholas of Cusa, Hugo Grotius, Blaise Pascal, Peter Canisio, Franciscus of Sales, Georg Wilhelm Hegel, Giovanni Regoli.

⁴⁸ Cf. A.G. DEBUS, *Man and Nature in the Renaissance* (Cambridge: Cambridge University Press, 1978); E. GARIN, *Rinascite e rivoluzioni. Movimenti culturali dal XIV al XVII secolo* (Bari: Laterza, 1975); E. GARIN, *La cultura filosofica del Rinascimento italiano* (Milano: Bompiani, 1994).

⁴⁹ Concerning Nicholas of Cusa, see for instance *Idiota - De sapientia*, I, 5; *De Beryllo*, 36.

⁵⁰ Cf. E.R. CURTIUS, *European literature and the Latin Middle Ages* (Princeton (NJ): Princeton University Press, 1990), p. 322. Cf. also W.E. PEUCKERT, *Paracelsus, Die Geheimnisse. Ein Lesebuch aus seinen Schriften* (Leipzig: Dieterich, 1941), pp. 172-178.

⁵¹ For the philosophical and historical contexts, see: W.R. SHEA, *Galileo's Intellectual Revolution* (London: Macmillan, 1972); K.J. HOWELL, *God's Two Books: Copernican Cosmology and Biblical Interpretation in Early Modern Science* (Notre Dame (IN): University of Notre Dame Press, 2002); T.H. LEVERE, W.R. SHEA (eds.), *Nature, Experiment, and the Sciences. Essays on Galileo and the History of Science in Honour of Stillman Drake* (Dordrecht - London: Kluwer Academic, 1990). Cf. also L. DUPRE', *Passage to Modernity. An Essay in the Hermeneutics of Nature and Culture* (New Haven: Yale University Press, 1993).

⁵² «[...] Procedendo di pari dal Verbo divino la Scrittura sacra e la natura, quella come dettatura dello Spirito Santo, e questa come osservantissima esecutrice de gli ordini di Dio [...]» (G. GALILEI, *Letter to P. Benedetto Castelli*, 21.12.1613, "Opere", edited by A. Favaro (Firenze: Giunti-Barbera, 1968), vol. V, p. 282).

⁵³ *Dialogo sopra i due massimi sistemi del mondo*, Dedicata al Gran Duca, in *ibidem*, vol. VII, p. 27.

⁵⁴ «La filosofia è scritta in questo grandissimo libro che continuamente ci sta aperto dinanzi a gli occhi (io dico l'universo), ma non si può intendere se prima non s'impara a intender la lingua, e conoscere i caratteri ne' quali è scritto. Egli è scritto in lingua matematica, e i caratteri son triangoli, cerchi, ed altre figure geometriche, senza i quali mezzi [sic] è impossibile a intenderne umanamente parola; senza questi è un aggirarsi vanamente per un oscuro laberinto» (*The Assayer*, in *ibidem*, vol. VI, p. 232).

⁵⁵ «Ma io veramente stimo il libro della filosofia, esser quello che perpetuamente ci sta aperto dinanzi agli occhi; ma perché è scritto in caratteri diversi da quelli del nostro alfabeto, non può esser da tutti letto: e sono i caratteri di tal libro triangoli, quadrati, cerchi, sfere, con, piramidi et altre figure matematiche, attissime per tal lettura» (*Letter to Fortunio Liceti*, January 1641, in *ibidem*, vol. XVIII, p. 295).

⁵⁶ «Since we astronomers are Priests of the Most High God with respect to the Book of Nature, it behooves us that we do not aim at the glory of our own spirit, but above everything else at the glory of God» (J. KEPLER, *Letter to Herwath von Hohenburg*, 26.3.1598, n. 91, in *Gesammelte Werke*, edited by the Kepler-Kommission, Bayerische Akademie der Wissenschaften (München: Beck, 1937ff), vol. XIII, p. 193). «For it is precisely the universe which is that Book of Nature in which God the Creator has revealed and depicted His essence and what He wills with man, in a wordless script» (*Epitome Astronomiae Copernicanae*, in *ibidem*, vol. VII, p. 25). «I make an effort to divulge promptly all these things, for the glory of God, who wants to be known through the Book of Nature. The more they will be raised, the more I will rejoice, with no envy at all. This is what I want, for I consecrated myself to God. I wished to be a theologian. For a long time I was troubled. But look and see now how God shall be praised through my work» (*Letter to M. Maestlin*, 3.10.1595, n. 23, in *ibidem*, vol. XIII, p. 40). Cf. also *Mysterium Cosmographicum. Praefatio*, in *ibidem*, vol. I, p. 5. See O. PEDERSEN, *The Book of Nature* (Notre Dame - Città del Vaticano: University of Notre Dame Press - LEV, 1992), pp. 44-45.

⁵⁷ Another example of a more "universal" way to read the book of Nature, within a scientific context, is that of Sir Thomas Browne, a physician who was contemporary of Galileo and Kepler. In his work *Religio Medici* (1643), he held that the book of Nature is easily understandable by everyone: «Thus there are *two Books*

from whence I collect my Divinity; besides that written one of God, another of His servant Nature, that universal and publick Manuscript, that lies expans'd unto the Eyes of all: those that never saw Him in the one, have discover'd Him in the other» (part I, ch. 15). Here “Divinity” means “theology” or “theological studies”. Cf. E.R. CURTIUS, *European literature and the Latin Middle Ages*, op. cit., p. 323. An attempt to read Thomas Browne’s doctrine in a contemporary, personal context, is that provided by A. Peacocke, “The Religion of a Scientist: Explorations into reality (“*Religio Philosophi Naturalis*”)”, *Zygon*, 1994, 29: 639-659.

⁵⁸ On the content of this section, cf. G. TANZELLA-NITTI, “The Book of Nature and the God of Scientists according to the Encyclical *Fides et ratio*”, *The Human Search for Truth: Philosophy, Science, Faith. The Outlook for the Third Millennium* (Philadelphia: St. Joseph's University Press, 2001), pp. 82-90.

⁵⁹ Cf. *Book of Wisdom*, 13,1-9.

⁶⁰ JOHN PAUL II, *General Audience*, Rome, January, 30, 2002, n. 6.

⁶¹ Cf. First Vatican Council, *Dei Filius*, n. 2; Second Vatican Council, *Dei Verbum*, nn. 3 and 6.

⁶² Cf. *Catechism of the Catholic Church*: «Thus the revelation of creation is inseparable from the revelation and forging of the covenant of the one God with his People. Creation is revealed as the first step toward this covenant, the first and universal witness to God's all- powerful love» (n. 288). «Even before revealing himself to man in words of truth, God reveals himself to him through the universal language of creation, the work of his Word, of his wisdom: the order and harmony of the cosmos - which both the child and the scientist discover [...]» (n. 2500). Cf. also John Paul II, *Address to the World Youth Day*, August, 15, 2000.

⁶³ Cf. *Book of Wisdom*, 13,5.

⁶⁴ Cf. *Epistle to Colossians*, 1,16.

⁶⁵ Cf. *Epistle to Colossians*, 2,9; *Epistle to Ephesians*, 1,10.

⁶⁶ Cf. G. TANZELLA-NITTI, “Le rôle des sciences naturelles dans le travail du théologien”, *Revue des Questions Scientifiques*, 1999, 170: 25-39. On the same topic, more extensively, *Scienze naturali, utilizzo in teologia*, in “Dizionario Interdisciplinare di Scienza e Fede. Cultura scientifica, filosofia e teologia”, edited by G. Tanzella-Nitti and A. Strumia, 2 vols. (Roma: Urbaniana University Press - Città Nuova Editrice, 2002), vol II, pp. 1273-1289 (English translation forthcoming in the web page “Interdisciplinary Encyclopedia of Religion and Science”, <http://www.disf.org/en>).

⁶⁷ It is common to quote Einstein’s question on this subject: «It could be said that the eternal mystery of the world is its comprehensibility [...] the fact that it is comprehensible is truly a miracle» (“Physik und Realität”, *Journal of Franklin Institute*, 1936, 221: n. 3). On the question of the intelligibility of nature, see for instance: E. WIGNER, “The Unreasonable Effectiveness of Mathematics in the Natural Sciences”, *Communications in Pure and Applied Mathematics*, 1960, 13: 1-14; M. HELLER, “Scientific Rationality and Christian Logos”, *Physics, Philosophy and Theology. A Common Quest for Understanding*, edited by R. Russell, W.R. Stoeger, G.V. Coyne (Città del Vaticano: LEV and University of Notre Dame Press, 1988), pp. 141-149; J.D. BARROW, *Pi in the Sky. Counting, Thinking, and Being* (Oxford: Clarendon Press, 1992); P. DAVIES, *The Mind of God. Science and the Search for Ultimate Meaning* (London: Simon & Schuster, 1992); P. DAVIES, “The Intelligibility of Nature”, *Quantum Cosmology and the Laws of Nature*, edited by R. Russell, N. Murphy, C. Isham (Città del Vaticano: Vatican Observatory Publications and The Center for Theology and Natural Sciences, 1993), pp. 145-161. For a theological perspective, G. TANZELLA-NITTI, *Gesù-Cristo, Rivelazione e Incarnazione del Logos*, in “Dizionario Interdisciplinare di Scienza e Fede”, op. cit, vol. I, pp. 693-710 (English translation *Jesus Christ, Incarnation and Doctrine of Logos*, web page “Interdisciplinary Encyclopedia of Religion and Science”, <http://www.disf.org/en>).

⁶⁸ O. GODART, M. HELLER, “Les relations entre la science et la foi chez Georges Lemaître”, *Pontificia Academia Scientiarum, Commentarii*, vol. III, n. 21, p. 11, quoted in John Paul II, *Discourse to the Pontifical*

Academy of Sciences, November, 10, 1979, in “Osservatore Romano, English week edition”, November, 26, 1979, p. 10.

⁶⁹ J. POLKINGHORNE, *One World. The Interaction of Science and Theology* (Princeton (NJ): Princeton University Press, 1987), p. 46

⁷⁰ E. HUBBLE, *The Nature of Science and Other Lectures*, San Marino (CA) 1954, quoted in O. Pedersen, “Christian belief and the Fascination of Science”, *Physics, Philosophy and Theology. A Common Quest for Understanding*, edited by R. Russell, W.R. Stoeger, G.V. Coyne (Città del Vaticano: LEV and University of Notre Dame Press, 1988), p. 133. On the humanistic and religious experiences associated to scientist’s activity, see. E. CANTORE, *Scientific Man. The Humanistic Significance of Science* (New York: ISH Publications, 1977).

⁷¹ *Book of Revelation*, 5,13, cf. 5,7-13.

⁷² Cf. *Book of Revelation*, 1,8; 21,6; 22,13.

The Structure of Scientific Revolutions (1962; second edition 1970; third edition 1996; fourth edition 2012) is a book about the history of science by the philosopher Thomas S. Kuhn. Its publication was a landmark event in the history, philosophy, and sociology of scientific knowledge. Kuhn challenged the then prevailing view of progress in "normal science". Normal scientific progress was viewed as "development-by-accumulation" of accepted facts and theories. Kuhn argued for an episodic model in which Prior to the Scientific Revolution, Europe and most of the world believed, as Aristotle asserted, that Earth was the center of the universe and that the sun, stars, and planets revolved around the Earth. During the Middle Ages, the Catholic Church and political structure forced everyone's attention to salvation & lacked support for scientific investigation. Meanwhile the feudal system focused everyone's attention to local concerns. What was the Copernican Revolution? Nicolaus Copernicus developed a mathematical theory of the heliocentric model: 1. the earth and the other celestia

Scientific Revolution, drastic change in scientific thought that took place during the 16th and 17th centuries. A new view of nature emerged during the Scientific Revolution, replacing the Greek view that had dominated science for almost 2,000 years. Learn more about the Scientific Revolution in this article. How is the Scientific Revolution connected to the Enlightenment? The Enlightenment, like the Scientific Revolution, began in Europe. (1566; "Six Books Concerning the Revolutions of the Heavenly Orbs"), the first published illustration of Copernicus's heliocentric system. The Adler Planetarium and Astronomy Museum, Chicago, Illinois. Get exclusive access to content from our 1768 First Edition with your subscription. The thing is, terms like "The Scientific Revolution" and even "The Renaissance" were coined in later times by people with political and social axes to grind. Scholars of "The Enlightenment" sought deliberately to demean the importance of the scholarship of the Middle Ages, because that was an era dominated by hereditary rulers. But in fact, most of the ideas of the "Scientific Revolution" had their antecedents in the Middle Ages, which in turn often expanded on ancient authors. Take the idea of empiricism as the basis of scientific knowledge. Long before the age of Copernicus, Kepler and Galil Before his invention books were transcribed by hand or 'printed' using wooden blocks. Both were a painstakingly slow and laborious process that effectively meant access to the printed word was limited to those who could afford their high price tags. Tang Dynasty around 700 AD Source: Ian Kiu/Wikimedia Commons. Did the Chinese invent the printing press? By the 1600's the Scientific Revolution of the Enlightenment was in full force, which would radically alter how Europeans viewed the world and universe forever. A process of thinking that would ultimately culminate in the Industrial Revolution - Thank you, Gutenberg et al! Source: Sidonius/Wikimedia Commons. Why was the printing press important to the Reformation?