

New relationships among science, philosophy and religious studies

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Abstract: In past times some religious studies built deductive theories managed by classical logic. On the basis of recent interpretations of Nicholas Cusanus' philosophical and logical thought it is shown that religious studies also can consistently use non-classical logic (intuitionist and modal ones). It was proved that through the intuitionist logic the main Christian teachings (enemy's love, Beatitudes, original sin) acquire full, rational meanings and that the main two dogmas of Christian faith result not only without contradictions but also perfectly rational. In this light it is no longer true that sciences are the only rational studies and religious studies are based on imagination, intuition, analogy, and metaphor; both can distinguish within their use of natural language at least two different logics, the classical and the intuitionist, and moreover they can rigorously reason. In addition, again in the wake of Cusanus, the dichotomy between actual infinity and potential infinity is recognized important for the Abrahamic religious studies, which always well-distinguish them as belonging respectively and distinctly to God and to man. Since half a century this dichotomy was formalized in two different formulations of the entire mathematics, the classical and the constructive formulation. Consequently, in religious studies there exist two dichotomies, which also turn out to be the foundations of the natural sciences and (according to Leibniz) of the activity of human reason. Then the interdisciplinary comparison between science, philosophy and religious studies is much more rich and fruitful than in past times, because it takes into account that 1) the foundations of both are pluralist and 2) the latter ones can also be well-formalized according to both logic and mathematics.

Keywords: Nicholas Cusanus, Not-Other, Intuitionist logic, Actual or potential infinity, Classical or constructive mathematics

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1. The discovery of Cusanus's legacy

Mainly Immanuel Kant and David Hilbert have rooted the common belief of the indispensability and the uniqueness of classical logic for science. Sometimes also religious studies conformed to classical logic till up to formulate deductive systems derived from few axioms (usually dogmas). But when both disciplines are conceived in classical logic (i.e. each one in a deductive-axiomatic way) the obvious "problem of

investitures" arises: what are the principles to be placed as first for all subsequent arguments, those of a scientific nature or those of a religious nature? In other words, you need to decide whether the scientific principles (applying classical logic) come first, or vice versa the religious principles; actually, this problem encompasses the entire problem of their relationship of the two kinds of studies; hence, it is irresolvable. However, axiomatic systems on religious subjects are not popular; to this kind of dogmatic theology, it is commonly preferred the pastoral theology, which usually elaborates in natural language images, metaphors, analogies, regardless of their rationality according to classical logic. Therefore, most people think that religious studies have a weak connection with reason (and even less with natural sciences) owing to the lack of a common rational language.

However, in the 30's two events changed this situation. A new kind of mathematical logic, the intuitionist one, was formalized on a par with classical logic (Heyting 1930; Kolmogorov 1932); moreover, it was discovered that the logic of quantum mechanics is a non-classical one (Birkhoff & von Neumann 1936). These achievements showed that on one hand natural language has more logical contents than those recognized in the past times (only those of classical logical), and on the other hand also natural scientific theories may be formulated outside classical logic. Hence, the addition of intuitionist logic to classical logic opens new panoramas to religious studies.

Actually, there exists an important precedent which however remained longtime unrecognized: the theological and philosophical thinking of Nicholas Cusanus (1401-1464). In the past times the studies on his thought met many difficulties. Cusanus oddly excluded from his writings collection a book of surely a crucial importance, *De li Non-Aliud* (Not-Other); it was discovered at the end of the 19th century. Therefore, a first complete edition of his works started in past century (Nicolai de Cusa 1932-2006).

The study of the numerous Cusanus's books was not easy; their themes range over subjects of very different nature (theological, philosophical, scientific, and political), each one treated by him according to different methods, even in contrast with each other. In the 19th Century Georg W.F. Hegel's references at Cusanus' thought have misrepresented him (Gabriel 1970). However, a century ago Ernst Cassirer wrote an epochal book: *Individuum und Kosmos in der Philosophie der Renaissance* (Cassirer 1927). In particular, he defended two theses: Cusanus was "the first modern thinker" because first introducing the infinity into human thought, particularly in the relation of the human mind with God and the World; second, Cusanus succeeded to introduce a new kind of logic. Since the occurrence of this book, interest in Cusanus' thought has burgeoned. Being all Cusanus' writings published in Latin, translations from his not easy kind of Latin into several languages have been offered: into Italian by Graziella Federici Vescovini (Cusano 1972), into English by Jasper Hopkins¹; translations into French, Spanish and others languages followed. In addition, a series of books suggesting introductions to his philosophical thinking (e.g., Santinello 1987) made easier to read main Cusanus' works. Eventually, some years ago a wide illustration of the contents of all his theological, philosophical, and scientific works has been edited (Flasch 2008). At present time we well know all what Cusanus wrote. The open problems are the interpretations of both these contents and their mutual connections.

However, scholars agree that his great philosophical activity introduced a surprising novelty. His intellectual life was devoted to find out bridges with God through more appropriate names than the traditional ones. Since his first important book (Cusanus 1440: I, chap.s xxiv-xxvi) he clearly distinguished two kinds of theology, a positive one

¹ Jasper Hopkins' English translations of almost all Cusanus' philosophical works are listed in his precious site online: <http://jasper-hopkins.info/>. In the following the quotations of Cusanus' texts refer to it.

and a negative one; they are characterized by what kind of attributes are ascribed to God; either the affirmative ones (say, merciful) or the negative ones (say, *infinite*); however, both are managed by Aristotelian (i.e. classical) logic, which is based on the bivalence law, establishing an absolute division (whatsoever proposition is either true or false).

In the above-mentioned book he introduced a leading idea, conceived in order to overcome the insufficiency of the two kinds of theology: the *coincidentia oppositorum*, which however are not contradictory in nature. Through it he started a seemingly paradoxical way of thinking in order, in my opinion, to discover all what he could conceive beyond the opposition of the affirmative and the negative. He was well-aware to be crossing a crucial borderline of the traditional way of thinking; he opposed contemporary followers of Aristotelian logic by denominating them an *Aristotelis secta* (Cusanus 1449: 463, no. 6). Eventually, at the height of his intellectual efforts to find more adequate names for God, he has suggested a name that is a double negative, Not-Other (Cusanus 1462); he attributed to it a great importance; he put this unusual name as title of the above book. In sum, through the exploration of the *coincidentiae oppositorum*, he discovered that in the case of a double negative (say, not-other), its corresponding negative (other) does not oppose to positive (the same).

He warned to have crossed the borderline with the traditional thinking:

It is evident that the philosophers who have not entered this [my new] field have not tasted of its very delightful pursuits. Now, that which frightened them away from having entered this field was the following; viz, that they [wrongly] presupposed that God, too—just as other things, which are subsequent to the possibility-of-being-made—must be sought within a difference of opposites. For they did not think that God is found prior to a difference of contradictory opposites. Therefore, claiming that the pursuit of God is included within the scope of the principle “Each thing either is or is not [the case],” they did not seek Him (who [actually] is more ancient than even that principle and who exceeds the scope of that principle) [within the correct field] (Cusanus 1463, Chap. 13: 1302, no. 38).

[Past] Pursuers, who are philosophers, did not enter this field [of not other] in which, alone, negation is not opposed to affirmation. For Not other is not opposed to other, since it defines and precedes other. Outside this field [of the logic of double negations] negation is opposed to affirmation—for example, immortal to mortal, incorruptible to corruptible, and so on for all other things except not-other alone. Therefore, seeking for God in other fields [than that of Not other], where [for cause] He is not found, is an empty pursuit. For God is not someone who is opposed to anything, since He is prior to all difference from opposites. Therefore, God is named animal, to which not-animal is [unavoidably] opposed [...] in a more imperfect way than He is named Not-other, to which neither other nor nothing is opposed... (Cusanus 1463, Chap. 14: 1304, no. 41)

Some decades ago, it was recognized a decisive logical result. The more accurate borderline between classical logic and almost all non-classical kinds of logic is not the law of the excluded middle, but the double negation law (Prawitz and Melnnaas 1968; Dummett 1977: 24). Being inequivalent to the corresponding affirmative word (“the Same”) as also Cusanus often stated, “Not Other” does not belong to classical logic, but, to the most prominent non-classical logic, the intuitionist one, where two negations do not affirm (Drago 2017: sect. iv). Hence, it is true that Cusanus introduced (five centuries of his formal birth) a new kind of logic. Cassirer’s intuition about this point was correct.

Surely, this innovation remained unrecognized along five centuries; but it is important because leads to change many past philosophical appraisals based on the notion of a simple negation, say “other”, which instead is essentially different from the double negative, “not other”. These past appraisals did not take into account that this radical difference concerns two different kinds of logic. Owing to this difference, at present Cusanus has to be credited to have introduced a new kind of theology, suggesting a rational relation of religious studies with logic and at last science.

2. Natural language and the relationships between different disciplines

On the other hand, the use of natural language goes beyond traditional philosophical dogmas of the indispensability and uniqueness of non-classical logic because it is well-known that it allows us to think in other kinds of logic, e.g. the modal one.

However, the various logics are distinguished from each other by the validity or not of well-defined laws (for example, in the previous case, the law of double negation; if two negations do not affirm, we are in intuitionist logic) which are not pointed out by common use of natural language. Hence, those who make a naive use of natural language ignore how to distinguish this basic ambiguity, although it gives rise to radical variations in the meanings of many concepts (e.g., does “not other” mean “the same” or not?). These considerations are even more cogent if one wants to compare not two words or simple sentences, but two theoretical structures, a scientific one and a theological one; then, the compared theories may be mutually incommensurable (because their logics may be different); and common language does not provide immediate tools for recognizing the cause of the incommensurability.

In particular, the use of suggestive images, analogies, metaphors and parallelisms² by pastoral theology has the cost of blurring the contents of the subjects of the discourse and therefore the cost of speaking by mere approximations, leaving the only possibility of alluding to the object of study through a narrative style; this style can be very suggestive and also poetical (e.g. when speaking of the Trinity); but it is depreciated by those who, by using classical logic, do not see in it any rationality.

Therefore, it is commonly thought that religious studies cannot compare fruitfully with the natural sciences, whose language seeks the exactness of language, that is, a single and precise logic in which it is necessary to reason in a rigorous manner. In other words, it is a common conception that the natural sciences are the realm of rationality, while religious studies are the realm of intuition and metaphor, where one does not reason with precision, except exceptionally.

As an instance of this preconception let us consider the usual translation of the following sentence concerning religious studies: “Est fides sperandarum substantia rerum, argumentum non apparentium” (Hebrews 11:1); the word “argumentum” is commonly translated as “knowledge”, because, after the birth of modern science, one does not dare to say that on “non-apparent things” one can really reason, as the Latin word said instead.

Unfortunately, it is forgotten that the “Greek miracle” of relying on reason interpreting the world was born from not the use of classical logic, but a popular research that was based on the concept of truth called “alétheia”, which means “*un-veiling*”, i.e. a double negation (it could be suggested that also in Hebrew the word for truth “emet” is a

² It is not commonly known that all the above linguistic figures substitute double negatives, e.g. a similitude substitutes “It is *not* true that it is *not*...”. As a fact, in natural language the cumbersome double negatives are replaced by expressions whose meanings are immediately graspable; in this way natural language’s search for making easier the grasping the meanings of expressions blurs the difference of intuitionist logic from classical one; that is, hides the use of non-classical logic.

double negative: “*no death*”). Therefore, if the historical development of Greek philosophy came to introduce abstract ideas (Plato) and formal reasoning (Aristotle's syllogisms) it is because before these philosophers there had been a broad collective research which was essentially based on intuitionist logic (which could also deal with religious studies).

In modern times, when classical logic dominated common thinking, many meetings between religious studies and natural sciences resulted in conflicts.

However, it should be noted that the most famous conflict, the one between the Catholic Magisterium and Galilei, had the usual roles reversed: the former actor reasoned apodictically, on the basis of a priori certainties, considered axioms of thought, from which decisive consequences through classical logic were derived; notice that in this logic what is different from the truth is considered as a contradiction and hence it has to be rejected. The latter actor, Galilei, reasoned by induction from experimental data; that is, in a way that was never explained by classical logic (in fact, Galilei reasoned in intuitionist logic; De Luise and Drago 1991). This case indicates that the traditional logical roles commonly attributed to the natural sciences and religious studies are not intrinsic to the natures of the two fields of study, but depend on the culture of the specific time.

3. The rationality of religious studies according to intuitionist logic. Gospel's teachings

The validity of the new point of view which also accepts intuitionist logic is confirmed by recent studies on some emblematic cases (Drago 2017: sect.s 6 and 8); they also indicate the fruitfulness of the use of this logic.

First, we note that in the light of intuitionist logic, Gospel's teachings change in rational ones. It is notorious that Gospel represents the most important religious teaching on love. But love in what sense? Western culture understood it as a Greek-Latin teaching (also because Gospel's two original texts have been written in these two languages), i.e. according to classical logic. Instead, Gospel represents a historical experience occurred in Middle East; and in the Eastern world all spirituality texts do not correspond to Greek thought, because they (for instance, the Indian Nyaya Nyāya) are full of negations and double negations.

The main teaching of Gospel on love is the following one: “Love your *enemy*” (Mt 5, 44). At first glance it is impossible to apply this teaching, because the enemy wants my evil in a radical way (even my death); and on my part, I of course reject this evil. In this case the two attitudes are the opposite ones, because the actors are inspired by two opposite motivations; we can represent them in short as A and its negation $\neg A$; that is a contradiction.

However, Gospel adds to previous teaching some operative teachings. For instance: “Do *not react to evil*” (Mt 5, 39). If intended as an invitation to remain passive, this proposition is repugnant. Rather, the proposition changes into an inspiring one by the addition of some qualifying words, essentially one negative word: “Do *not react to evil* [by means of *evil*]”; this proposition means that one has to react to an opponent, yet *without* doing *evil* to him. This correction into double negatives no longer invites the absurd behavior of remaining passive in the face of evil; but it is a precise indication not only to avoid the worst implications of the conflict for both, but also to strive to transcend the evil (threatened or accomplished) by the other in the aim at approaching a cooperative attitude with him.

Indeed, in Luke (6, 27) the above surprising teaching “Love your *enemy*” is followed by a more clear indication of what one is invited to do: “Do good to those who *hate* you”. In

Matthew the same indication comes from the teachings of the slap on the cheek and the following similar teachings (Mt 5, 39-42); after them the some more clear teachings occur: “Love your enemies, bless those who curse you, do good to those who hate you, and pray for those who spitefully use you and persecute you.” (Mt 5, 44) In this light the “golden rule” (Mt 7, 12) is perfectly clear: “So in every situation, do to others what you [even within a conflict] would have them do to you, for this sums up the Law and the Prophets.” Each texts of these teachings is made transparent by adding a suitable negative word: “Love [who is *not* really] your *enemy*”; “Do good to those who [it is *not* really true that] *hate* you”; where the words “*not* really” represent the loving actor’s hope to open through his good actions the opponent to a better attitude than the attitude of hating.

Accordingly, the first above teaching means: “Love [the person who seems but is *not*] your *enemy*”. This is a crucial teaching to who wants to follow the teaching of brotherhood as a supreme value, even higher than the value of his own survival, exactly as Christ taught and did. This kind of love may be called a “love with *no reverse of hate*”, or “a love *without limits*”³. (Lanza del Vasto 1950: 70, 74); both expressions are not affirmative words representing the objective world, but double negations, whose meanings is to opening the situation to a better future.

The above logical interpretation is confirmed by the logical interpretation of the celebrated Christian teaching: “Love your neighbor as yourself” (Mt 22, 37–39). The word as is a modal word; it is equivalent to “*neither more nor less* than”; (the words “more” and “less” are negations of equality, which is the only relationship between two given terms allowed by classical logic)⁴; in sum, previous proposition actually includes two double negations, each one not equivalent to an affirmative word (equality).

4. The rationality of religious studies according to intuitionist logic. Christian Beatitudes

The top of Christian teaching of love is represented by the Beatitudes, which deal with the authentic love for themselves and for others.

At first glance one notices that whereas in Matthew (Mt 5, 3-10) all Beatitudes are in the affirmative («Blessed...»), in Luke four of them are in the affirmative («Blessed...»; Luke 6, 20-22), while the other four are in the negative («Woe»; Luke 6, 24-26). This fact shows that one has to be careful in taking in account text’s use of negations.

Let us first consider Matthew’s ones. Each proposition starts with an exciting word (“Blessed...”), but just after it invites to accept a sacrifice; at first glance this sacrifice seems to derive from a masochistic attitude, inexplicably exalted as an ideal of life. What is the true meaning?

Let us notice that the love of a mother always involves a sacrifice. Hence, it is not surprising that the sacrifices called by the second four Beatitudes are clear acts of love towards others: to be merciful, to make peace in the neighborhood, to fight for social justice for all⁵. In comparison with these ones, then the first four Beatitudes acquire a

³ In order to make easy to the reader the recognition of a double negation I underline each negation of it.

⁴ This result is supported also by a formal achievement: there exists a translation of the entire modal logic *via* its S4 model into intuitionist logic (Hughes and Cresswell 1996: 224 ff.).

⁵ In the list of Matthew’ Beatitudes the sixth one is odd. “Blessed are the pure in heart, for they will see God.” This promise is senseless, because it is a basic teaching that all saved persons after their deaths will see God. Moreover, the words “pure in heart” concern an intimate realm only; as such they break the global progression of the Beatitudes from the most inner feeling (in the first one) to a public struggle (in the last one). This progression is apparent also in the specific step at issue (the skip from the previous “being merciful” to the following “being peacemakers”). Notice that Jesus preached in Aramaic language

clear meaning: also they express sacrifices accepted for loving the deep himself against the humiliations that the social evil powers impose to people. This exact meaning is obtained by adding essentially one more negative word; for example: “Blessed are those who in virtue of the Holy Spirit [are *denying* their social] *evil*”; in short: “Blessed those *denying* their *poverty*”, and so on for the following Beatitudes. This improvement of the original text leads to find the structure-type of each proposition of the first four Matthew’s Beatitudes: “Blessed are those who in virtue of the Holy Spirit [are *denying* their] *suffering an evil social status*”. In other words, it leads to love the true himself independently and also against the social constraints, i.e. the imposed structural evils.

By the same method of adding some negative words we can restore the full meaning of Luke’s Beatitudes. For instance, “Blessed the *poor*’s” may be changed into: “Blessed those *denying* in virtue of Holy Spirit their status of *poverty*”. The invitation is to love themselves beyond the social constraints.

Let us now consider the promises ending the propositions of Beatitudes. In Luke they are at the future time. Instead, in Matthew the first Beatitude and the last one are at the present time; this fact means that the promises are fulfilled also on Earth.

Also they present a progression more or less well-expressed by the original words: from a promise to live an undefined God’s kingdom (only as an intimate experience?) to receiving valid helps on the Earth (to receive mercy) and in the last four a progression towards a life on the Earth ever closer to God’s life. In short, the promises of the Beatitudes progress from receiving God’s kingdom in the interior life till up to approach a communitarian life with God Himself⁶.

In the light of this interpretation of Matthew’s original text also the four Luke’s curses are clear; the accursed have chosen the opposite attitude to that of previous persons called blessed, i.e. they *deny* their social *evils* not in virtue of Holy Spirit and in view of the spiritual promises, but to exploit the social affairs in view of their own selfish growths. In short, these cursed pursue an exclusively selfish love, i.e. a dividing love which at last generates hate, instead of the love leading to fraternize with the others.

In sum, we have learned that the true love is to love as first himself even against the scourges created by social structures and then to oppose the negative trends, not only in oneself but also those coming from outside.

In logical terms, we have obtained that both versions of Beatitudes are based on doubly negated propositions; whose meanings are very cogent to a spiritual path of progression to God; the paid little cost is to have added to each one of the text (presenting simple

while Gospel’s original texts are written in Greek and Latin. One may suspect that the texts are not faithful to Jesus’ words. Full meaning of the sixth Beatitude is restored if its first part is made similar to the other ones which present a progression of an ever stronger commitment with social affairs. In order to restore its meaning one has to express it by making explicit the crucial point of this progression, i.e. the introduction of the social commitment; “Blessed those [committed in social affairs being] pure in heart...” Now the words “pure in heart” have a full meaning because they lead to establish unselfish social relationships by at least rejecting all trickeries and thefts which social affairs allow at the expense of poor and naive people. Once the first part of this Beatitude is restored, the words of its promise may be easily modified in a great gift: “... because they will [be capable to] see God [in every person]”, that is the highest reward for a person working within the social life which sometimes is like a jungle of savage animals.

⁶ A further analysis would manifest that each promise is obtained by applying the PSR to the doubly negated propositions of the former parts of the Beatitudes. This application is performed by not the person denying the social evil, but God; hence, given the greatness of God, it constitutes not only a logical translation from the doubly negated proposition of intuitionist logic into the corresponding affirmative proposition of classical logic (as it occurs in the case of the crying persons who will be consoled, or the merciful persons who will be rewarded by receiving mercy) but in an abundant reward (as in the case of peacemakers which will be rewarded to be called sons of God).

negated propositions but that may be unfaithful to the original Jesus' words) one more negative word.

5. The rationality of the religious studies. The origin of the evil

Why even Christian teaching on love presents it as a struggle with himself? Why spontaneous love is not enough for a happy life? Why spontaneous love may be wrong so to lead to the worse catastrophes (e.g. the love for Helen of Troy)? What is the origin of hate?

Genesis 3 explains this origin; which is pictured as to have eaten a forbidden fruit. What it means?

According to Cusanus original sin is caused by a diversion of the human intellect from its original aim to a propensity to support the *spiritus divisionis* (Cusanus 1461: book II, n. 17).

With more adequacy to the text Lanza del Vasto (1959: chap. 1) remarks that the name of the tree generating this fruit is the "knowledge-of-the-Good-and-the-Evil" (Genesis 1, 17). According to him, human reason has assumed as a principle of life what this name means, i.e. the knowledge of two separate and opposed realities (Good and Evil), to be exploited according to one's own tendency to achieve selfish ends. In general, the original sin leads to see the world as a material good to be grasped and exploited according to the selfish motivation of the love for himself (Lanza del Vasto 1959: chap. 1); that means to obtain one's material goods for himself irrespectively of the evil that is caused on the others. This is a clear dualist view, opposing personal behavior to other's behaviors. Hence, to eat the fruit of that tree means to interiorize within the knowledge this radical dualism leading the ethical personal behavior to subdue the world to selfishness. In such a way the relationships with others undergoes the dichotomic law of classical logic (True/False) as it would be an absolute law.

From this dualistic attitude the conflicts with others and with nature directly originate. Instead the social consequences of the original sin originate in a somewhat indirect way. Social institutions are built by the conscious or unconscious mutual interactions of all persons cooperating to support the social life. Yet, an institution may hide through its laws imposed to all the evil attitudes of the cunning persons; who can also create new social structures, imposing on the people formal laws with the deliberate purpose to hide their malevolent aims. In sum, evil may grow till up to oppressive institutions; see dictatorship, capitalism, colonization, planned unemployment, etc.. They are all instances of structural sins or structural violence which are committed by all, goodwill persons and malevolent persons, honest and dishonest, rich and poor, etc. At last, the society may be essentially dominated by evil institutions (let us recall that in the second temptation Satan offered to Jesus exactly his ownership of the power on the entire society; Mt 4, 8-10)⁷.

Who liberated mankind from the original sin? The elected people of Jews usually obeyed the first (affirmative) commandments, while the other (social) commandments seemed impossible in some circumstances; mainly the obedience to the commandment "Do not kill" seemed impossible in the terrible context of a war opposing two populations. In such a case the Jewish people (and even more the other peoples) preferred to obey the laws emanated by their social institutions (state, army, courts, capital, market, etc.), built in order to organize their society. In such away they evaluated

⁷ Notice that Jesus' propositions rejecting the three temptations are DNPs; two of them essentially included the word "only" (= *not otherwise*); Jesus' other response was: "Do not tempt God."

some institutional commitments more cogent than their relationship with God; in such a way they deliberately committed a collective disobedience to “Do not kill”.

Traditional Christian teaching says that the mission of Christ was to lead to fulfill the Law, i.e. to teach mankind how to overcome this structural sin since its root, the *spiritus divisionis*, in sum to restore love for others in just all circumstances. In the history of mankind Christ’s task was to bring mankind to accept the social commandments even when one has to oppose social structures, i.e. through also fights with the structural violences of evil power. Christ came into the World in order to establish, notwithstanding the evil laws of social institutions⁸, the full validity of the social propositions written on the second table of commandments; in other words, to establish the absolute validity of the social propositions of this table. As a matter of fact, they are all doubly negated propositions of intuitionist logic (e.g. “Do *not kill*”). In positive terms, the Messiah came to restore the brotherhood, i.e. the law of love in a generalized way; that means in every circumstance, the conflicts too. That means that the meanings of the so-called commandments (actually called by the Bible “ten propositions” radically changed: from authoritarian obligations (as a person who espouses classical logic understands them, because he sees as their main parts the first words “*not*”) into paternal warnings (recall how Jesus’ prayer invites to call Him: “Our Father...”), that each person has to consider as – exactly in agreement with the role played by a DNP - a methodological principle for managing his life in the best possible way. E.g. in the case of “Do *not kill*”, he has to manage his life in such a way to avoid all conflicts potentially leading to killing the opponent, and however, if involved in a conflict, to find out a positive solution of it through the love of the enemy.⁹ In this way Jesus restored love towards everyone even in the most dramatic moments of human life. By previous examination on Christian teachings we learnt that the true love is attained by pursuing the double negated notions *un-selfishness*, do *not* want the *evil*, *not-hate*, *non-violence*; that means also that he restored the use of the doubly negated propositions in all social circumstances. In this way Jesus introduced into mankind’s ethics a kind of logic which is very different from the ancient logic of obedience to compulsory commands coming from an absolute, separate authority and the logic of opposing other men in a war as an animal against animals of a different species; he overcame the *spiritus divisionis* governing both situations; he set himself as a bridge in both the relationship between mankind and God and in the love relationship of a each person with others, even

⁸ Truly, Jesus’ summary of the Law and prophets are two commandments: “Love God..., love your neighbor...” (Mc 13, 28-31). However, these commandments are odd, because no one can love on command. Actually, love implies a change of methodology: from that of a servant’s blind obedience, to that of paying the greatest attention to the relationships among people in order first of all understand the motivation of the other; in the case of a conflict, to understand opponent’s deep motivation. Then, one can read Jesus’ words as follows: “ [If you want to behave in a servant’s way towards God] I give you a new commandment [which however is quite different from the previous ones]. My [pseudo-]commandment is this: Love each other as I have loved you.” (John 15, 12).

⁹ Jesus was condemned and killed by the two strongest social institutions of his time, well representing *par excellence* the two kinds of evil institutional power: the imperialist political power and the formalist religious power. Worldwide Roman Empire was essentially negative because founded on a military domination; the Jewish religious institution also was essentially negative, although claiming to be directed by God Himself, because survived through profound compromises with the Pagan empire. The religious institution condemned Jesus precisely according to the deep meaning of original sin, i.e. its priests (dishonestly justifying their decision with people interest) wanted to preserve their social power (i.e. their good) imposing the cost of *this decision on another*, i.e. they took the decision of the survival of their power by imposing death to Jesus): “It is expedient that one man should die for the people.” (John 18, 14)

enemies. Only for this capability of conversion of even the enemy the presence of evil on the earth does not efface the persistence of the love in mankind history¹⁰.

In logical terms, with respect to the two polarities of mutually opposed good and evil he introduced the logic of transcending the *evil* by *negating* it, for searching a mutual understanding and love, at the cost of *overcoming selfish interests*. Of course, to follow him requires a conversion, which as first implies a change of the kind of logic, from the classical one to the intuitionist one; this change is the so-called “double negative translation” (Troelstra & van Dalen 1988: 56 ff).

6. New way of reasoning and new organization of a theory

The mark of the cogency of intuitionist logic to religious studies is mainly given by the possibility to reason through intuitionist logical arguments; which essentially are *ad absurdum* arguments. In this light, is very important the case-study of Cusanus who consistently reasoned in a different logic from the classical one; indeed, some *ad absurdum* arguments are present in Cusanus' books. Rather than quote some, yet cumbersome, Cusanus' arguments of this kind, I show that they are very old in religious studies. Maybe the most ancient is the following one: “God exists. Because if God does not exist, the world has been created by the man. But the world is infinite and man is finite. Hence it is *impossible* that God does *not* exist.” The conclusion is a doubly negated proposition. In intuitionist logic, where the double negation law fails, it cannot be changed into the corresponding affirmative proposition (as classical logic instead allows it), Hence, this change is rather suggested by a subjective motivation or reason.

In the model of theoretical organization based on a problem, the change of the conclusion, a doubly negated proposition, into the corresponding affirmative proposition is obtained by applying the principle of sufficient reason (PSR); it explicitly translates a doubly negated proposition (“*Nothing is without reason*”) into the corresponding affirmative proposition (“*Everything has a reason*”), although, as the same Leibniz states (Leibniz 1686), we do not always have evidence for this conclusion; which however is motivated by the faith in human reason, which after having reasoned on the subject and obtained a conclusion through an argument believes that reality corresponds to our reasoning on it. One easily proves that the application of the PSR is a translation of the entire intuitionist logic into classical logic; that implies that the problem-based organization changes into the axiomatic organization where the translated conclusion works as an additive hypothesis.

All that shows that this kind of argument cannot belong to an axiomatic system, entirely managed by classical logic operating through implications on affirmative (or negative) propositions. Hence its intuitionist reasoning introduces a great novelty: this logic is incompatible with a deductive-axiomatic theoretical organization. Already Goedel's theorem has proved that the axiomatic organization cannot completely represent even the simplest mathematical theory, arithmetic. After this result it would have been wise to start a collective search to find out another theoretical organization, one which is complementary to the axiomatic one. That has not been done (except for the logician Beth 1959: par. 1, 2). Actually, this kind of research had already been started a long time before: Jean D'Alembert, Lazare Carnot, Antoon Lorentz, Henri Poincaré and Albert Einstein claimed that there is such an alternative organization to the deductive-axiomatic one; they had summarily listed some of its characteristics and had indicated examples of it in the history of physics. Recently, a comparative analysis of all non-

¹⁰ Gandhi supported this view by means of an *ad absurdum* proof: “An eye for an eye will leave [absurdum:] the whole world blind.”

deductive-axiomatic scientific theories has recognized their common model, which is based on the search for a new method to solve a scientific problem by reasoning through intuitionist logic (Drago 2012).

As a consequence, the dichotomy which, in formal mathematical terms, is between classical logic and intuitionist logic, in philosophical terms is between the deductive-axiomatic organization and the organization based on the search for a method aimed at solving a given problem.

7. A rational faith in both the dual nature of Jesus and in the Christian Trinity

A first remark about the two main kinds of theology. The dogmatic theology is organized according to axiom-principles (i.e. dogmas) and therefore is regulated by classical logic, whereas pastoral theology is based on the problem (of salvation) and therefore is regulated by the second logic, the intuitionist one (though the latter theology traditionally mostly uses the style of a story-telling). By taking into account the latter logic the above classic distinction between them acquires an accurate meaning.

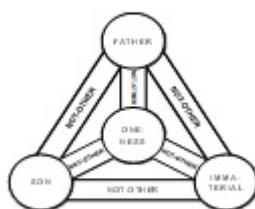
About the Christian dogma of the dual nature of Jesus, it is enough to recall the statements of the Chalcedonian council which defend it in the year 451: Jesus had two natures, human and divine, “*without mutation and without confusion*”, “*without separation and without division*”; the four expressions all are double negations, without equivalent affirmative words, because the “equality” of the two natures is a priori excluded.

Finally, let us consider the problem of how to conceive the (so-called by Cusanus) Tri-Unity. On this theme two millennia of reflections, always conducted within the classical logic, have passed. But this reflection has not brought solutions to the many paradoxes that Christian dogma implies (for example, are the three Persons equal to one?). This failure is interpreted as on one side a proof of the inconsistency of Christian faith; on the other side the impossibility to be rational in all faith’s questions. Instead in intuitionist logic the problems of defining Trinity have rational solutions which are fully comparable with the solutions of problems in natural sciences.

Already in the year 1462 Cusanus suggested a rational conception of the Trinity. In the above I noted that Cusanus named God by making consistent use of double negations, which he correctly qualified as not pertaining to classical logic; e.g., he named God as “*Not-Other*” that is not equivalent to “*The Same*”; owing to the characteristic failure of the law of double negation the former words belong to intuitionist logic. He then came to formulate a new definition of the Trinity through the phrase “*Non Aliud est Non Aliud quam Non Aliud*” (*Not Other is Not Other than Not Other*), which is logically exact in intuitionist logic (whereas in classical logic is a tautology without content).

Recently, a solution was suggested by (Drago 2019) who improved Cusanus’ presentation of Trinity till up to offer a consistent and detailed interpretation of Him on the basis of two kinds of logic (classical and intuitionist) plus the translations (direct and inverse) between the two kinds of logic). The inner relationships between each couple of Persons and also the relationships of each Person with Oneness all are represented by the double negation “*not-other*” (e.g., the Son is *not-other than* the Father). This interpretation is corroborated by the so-called “Athanasius’ creed”, a summary of Christian tenets of this dogma; it is based upon a lot of double negations, which are specifications of the previous ones.

The triadic structure of the following figure results; it is the intuitionist version of what is commonly called *Scutum fidei* (shield of faith) representing Trinity in classical logic. The Oneness is obtained by application PSR to each double negation *not-other*, expressing both the relationships of each Person to Unity and His relationship with each other Being (Drago 2019).



It is easy to recognize in a general way that the application of the PSR inside a theory, implies the translation of the entire kind of logic, from the intuitionist one to the classical one. By ingenuousness Cusanus attributes this result to God as his main power: to change “*posse*” into “*est*”, and vice versa. Therefore he called God as *Possest* (it is the title of his book of 1460), the shortened word of the previous two Latin words. Being *posse* a modal notion equivalent to a double negation, “*Possest*” represents the crucial God’s nature, i.e. to be the logical translation of the three Persons into the Oneness.

All that represents in a clear logical way the immanent Trinity (inner Trinity). Under this light, a monotheist religion cannot justify why its God, who of course wants to be accepted by human mind, represents only one kind of logic, the classical one. Therefore, for the good reason of taking into account the present time pluralism of logics, also non-Christian religions may share the intuitionist idea of Trinity.

I remark that we have obviated Kant’s criticism, i.e. to undergo God to our reason. We have obtained not a comprehension of God; this result is impossible since God cannot be circumscribed (otherwise, it would be a fetish). Rather, we have obtained an intelligence of God, in the original sense of the Latin word *intus-ligere*, which means “reading inside”.

In sum, in the above it was proved that intuitionist logic represents some basic tenets of Christian faith better than classical logic; Hence, also religious studies may use non-classical logic, as natural sciences do.

8. Two dichotomies

Let us now come back to the question of how to characterize the suitable language for the interdisciplinary studies between religious studies and natural sciences. In the last century also the philosophical notion of infinity, already distinguished by Aristotle in actual infinity and the potential infinity, was formalized through mathematics as two distinct theoretical formulations of the entire mathematics: either the classical formulation, making use in modern times of actual infinity, or the constructive one, bounded to use (almost only) potential infinity (Markov 1961, Bishop 1967). As a consequence, since some decades one more formal dichotomy has emerged: beyond the formal dichotomy on the kind of logic: that on the kind of mathematics. Notice that each dichotomy has two natures; the first dichotomy has the philosophical nature concerning the two kinds of organization, and a corresponding formal nature concerning the two kinds of logic; the other dichotomy has the philosophical nature concerning the two kinds of infinity and the corresponding formal nature concerning the two kinds of mathematics.

It is noteworthy that in Western philosophy Leibniz intuited these two dichotomies; he had recognized two labyrinths in which human reason astray: infinity (actual or potential) and law or freedom (that is, the two above kinds of organization as they are subjectively experienced). He saw these labyrinths as insurmountable by the human reason. After three centuries of unsuccessful reflections on them, we have to conclude

that they can be resolved only by choices; therefore, Leibniz' labyrinths are more properly dichotomies.

The entire modern Western philosophy offered only this contribution to this new conception of the foundations of science; this depends on the fact that it chose to follow ontological metaphysics; which in Greek philosophy was instead on a par with henology (= the search for unity) (Wyller 1997; Reale 2008). Among modern philosophers only Cusanus and partly Leibniz have sought unity and hence followed the henological metaphysics.

In the light of the two dichotomies, the traditional philosophy of science appears to have been enclosed by a preconception, as it is shared by those who know only classical logic: the uniqueness of truth; or, more specifically, it was dazzled by the Newtonian paradigm, by intending as paradigm the ideological-scientific construct, which is based on the two Newton's choices on the two dichotomies: the actual infinity (infinitesimal analysis) as the unique valid mathematics for the interpretation of nature and the deductive-axiomatic organization (as instantiated by his mechanics' theory governed by its three principles) and hence the classical logic.

Notice that the novelty of the two dichotomies emerged from the reflection on the modern scientific theories, which have become so numerous as to spontaneously represent the alternative theoretical attitudes to the Newtonian paradigm. In fact, since the time of the French revolution, some alternative theories were born; each of these theories made use of simple mathematics (hence without actual infinity) and its theoretical organization was based on a problem: Lavoisier's chemistry, Lazare Carnot's mechanics, Sadi Carnot's thermodynamics, Lobachevsky's first non-Euclidean geometry, etc.¹¹

From a graphic point of view, the conception of the two dichotomies as the foundations of knowledge may be represented in a simple and very suggestive way. Since the dichotomies are mutually independent, they can be crossed so as to form a compass, which like that of sailors, allows the human mind to choose a direction within the present sea of so many scientific theories.

9. New relationships between different disciplines

Past scholars conceived the relationship between natural sciences and religious studies in an unbalanced way. From the top of its formalism managed by an absolute reason formally based on classical logic natural science evaluated religious studies as an essentially intuitive and informal, and hence primitive in nature field of studies; because only the former discipline has a formal language, while the latter discipline few times constructs axiomatic systems, but mainly makes use of informal, natural language.

In retrospect, the novelty of the point of view of the present study essentially is to have introduced a pluralist foundation of each of the two scientific domains, mathematical logic and mathematics, that before had been instead considered based in a monolithic way. After this novelty the old relationship dominated by an a priori absolute reason is no longer possible.

The above illustrated two dichotomies offer a new basis for the inter-disciplinarity dialog between natural sciences and religious studies. On one hand, religious studies are based on these two dichotomies. The religious studies make use of both choices on the

¹¹ It is not a chance that they had been marginalized (eg. chemistry), fought against (eg. non-Euclidean geometry), ignored (eg. Lazare Carnot's mechanics, Sadi Carnot's thermodynamics); and that they have been recognized as valid theories not before some decades their respective births; and moreover, only recently they have been recognized as alternatives to the Newtonian paradigm (Drago 2019).

philosophical notion of theoretical organizations: either the deductive organization by dogmatic theology, or the problem-based one by pastoral theology, which at present time has to be considered on a par to the former one; in addition, these studies rely on the corresponding formal choices: either classical logic or intuitionist logic. About the other dichotomy, infinity, religious studies certainly do not currently make use of (the two kinds of) mathematics, but make a precise distinction on the philosophical notion of infinity (at least in the Abrahamic religions), by attributing actual infinity only to God and potential infinite to a man. On the other hand, also science is based on two dichotomies, each dichotomy being intended in both formal and philosophical terms; that amounts to four choices, each one offering a potential bridge to other kinds of studies; in sum, eight potential bridges. At present, all these bridges, apart those of the two kinds of mathematics (which may be explored by religious studies) can connect science and religious studies.

This new situation makes the inter-disciplinary comparison between natural sciences and religious studies much richer than that of past time, also including two comparisons (through the two kinds of logic) of formal nature. Hence, in the faith-reason relationship there exists a common rationality and a common language, albeit of a pluralistic kind.

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