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Metaphysical permanencies and variations on Medieval and Renaissance minor beauty

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Abstract

This article aims to explore a theme of the *metaphysica paupera* from the reflections of the Friar Minor Luca Pacioli, highlighting their roots in the Neo-Platonic and Augustinian tradition, but also in some aspects of the Franciscan one. I will show, firstly, how in the early Franciscan environment the idea of minor beauty was progressively developed in relation to the form of life that places poverty at its centre. Secondly, I will outline how, in Bonaventure's reflections, this idea, initially associated with a practical and moral dimension, is reframed in a theological sense, in terms of evangelical perfection, and in a metaphysical sense, finding its full foundation in the idea of a proportional beauty that establishes a metaphysics of relationship. Finally, I will highlight how both ideas – that of a metaphysics of relationship and a Franciscan matrix – persist in Pacioli, in his mathematization of knowledge, capable of including minor beauty as the metaphysical principle of the world, as well as of all human activities and forms of knowledge.

Keywords: Beauty; proportion; Franciscan thought; Luca Pacioli

Prelude

Searching for a *metaphysica paupera* between the Middle Ages and the Renaissance means paying attention to at least two points. On the one hand, it means taking into account small, poor, and everyday objects, or minor values, which are included in attempts to explain the meaning of the world coherently from first principles. On the other hand, it refers not only to objects, but also to the kind of metaphysical view that has poor features, such as an awareness of the limited possibility of finding a definitive and certain foundation for the principles of the world, or the fact that it pays attention to things not for their substantive aspects, but for their relations, in order to show the interconnectedness of the cosmos. In this perspective, we can consider critical and sceptical attitudes, that propose principles which are not properly grounded theoretically, but principally serve ethical and political purposes. Or we can consider other attitudes that, at their core, are based on inferior senses such as sensation.

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In this article, the question of *metaphysica paupera* will not be addressed in the sense in which it would be if one were to study the critical thought of Nicholas of Autrécourt (see, for example, Salvestrini 2024b), where constant doubt and a foundationalist perspective allow him to propose an epistemology and a metaphysics based on the probable and open, also in a rhetorical way, to the constitution of social life.

Here, the idea of *metaphysica paupera* will rather be explored in relation to an intellectual figure such as Friar Luca Pacioli who, in certain respects, can be considered a *strong* thinker because of his commitment to a mathematical foundation of the cosmos and human knowledge, derived from both a Neo-Platonic and Euclidean perspective.

In order to understand the poor aspects of Pacioli's metaphysics, we will focus on three issues: 1) the constitution of a relational principle of things that has at its core the idea of a proportional and harmonious beauty; 2) the inclusion of vulgar, poor, and minor arts in his metaphysical vision; and 3) the Franciscan theological and philosophical framework, which reinterpreted certain aspects of the spiritual teaching of Francis of Assisi on a speculative level and seems to offer a condition of possibility for the amplification of those aspects of Pacioli's thought that go towards a metaphysics of poverty.

The argument is divided into two sections. The first section outlines the genesis of the proportional and relational idea of beauty within the Franciscan tradition, first in the earliest sources and later in Bonaventure's thought. The second section highlights the poor aspects of the Franciscan metaphysical framework, by focusing firstly on Pacioli's idea of *divina proportione*, and then on his commitment to dignifying the vulgar arts starting from the mathematical foundation of theoretical and practical knowledge.

Franciscan 'minor' beauty

As I have argued in a previous work (Salvestrini 2023b), there are reasons to believe that some aspects of the constitution of the proportional and harmonious idea of beauty in Franciscan texts derive not only from the intersection of traditions such as the Neo-Platonic and the Augustinian in the philosophical field, or the rhetorical-musical one, but also from specific inspiration provided from the teachings of Francis of Assisi. The outcome of this interweaving of meanings is certainly diachronic, but it defines a particular idea of beauty, which we could call a 'poor' or 'minor beauty,' because it concerns, on the one hand, the attribution of dignity to minor values, such as poverty, simplicity, and humility, or to the humblest things in the scale of society and of being, such as illness, animals, or even every small creature of God (Sorrell 1988; Merlo 2003). On the other hand, it concerns the possibility of the metaphysical concept of beauty being linked to the lowest things of the world, of lowering its ontological status, and of being a relational rather than a substantive principle.

For the purposes of our discussion of *metaphysica paupera*, it is interesting to underline the correlation between the semantic field of beauty and poverty. The question is a broad one in the Franciscan sources of the 13th century and falls beyond the scope of this paper. It could also be addressed by referring to other connections of the concept of beauty, for example, with humility, creatures, and stigmata, which highlight minor things or values, or even with the lowering of the God to the human level. The passage from Franciscan sources such as the texts by Francis of Assisi, Clare of Assisi, and the

Life by Thomas of Celano, to Bonaventure's *Life* reflects a kind of transposition into a speculative and often metaphysical sphere, of values and features initially approached from a narrative or spiritual perspective.

In sources such as the *Forma vitae ordinis sororum pauperum* by Clare of Assisi and the *Vita beati Francisci* by Thomas of Celano, the ideal poor life, *altissima paupertas*, is associated with the semantic field of beauty, through a lexicon that underlines interesting variations and nuances of meaning, including those of proportion, splendour, and elevation. In the *Forma vitae* the correlation between the poor life and moral sublimity is highlighted:

This is that summit of the highest poverty which has established you, my dearest sister, heiresses and queens of the Kingdom of Heaven; it has made you poor in things but exalted your virtue¹. (Clare of Assisi 2006: 119-120)

The semantic variant of beauty of interest for our purposes is the 'sublime,' which has both a rhetorical and a theological use. In this period, it often signifies a moral quality, underlining a kind of disproportion between the human and the divine spheres. But it also means the elevation of the subject to the non-human and divine realms for a moral commitment. The 'sublime' also emphasizes an aesthetic quality derived from the moral one (see Deproost 2019; Jaeger 2010, 2022 and 2024), and in this case it is noteworthy that living a poor life, with poor things, leads to moral elevation.

In the *Vita prima sancti Francisci*, Thomas of Celano repeatedly presents the personification of *Paupertas* as a beautiful woman and bride, highlighting once again a transvaluation of traditional values in the correlation between the poor life and the semantic field of beauty. In the passage I would like to recall, Thomas uses two words from this semantic field, *pulchrum* and *forma*:

People thought he wanted to get married, and they would ask him: 'Do you want to get married, Francis?' He replied: 'I will take a bride more noble and more beautiful than you have ever seen, and she will surpass the rest in beauty and Excel all Others in wisdom'². (Thomas of Celano 1999: 188)

In this dialogue, Francis underlines some significant features of *Paupertas*, turning it from a condition of social marginalization to an elevated quality to which one can aspire: *Paupertas* is noble and beautiful, that is, she is of a high rank, good-looking, and a source of wisdom – qualities that are contrary to those commonly assigned to her.

A thinker like Bonaventure transposes Franciscan values such as humility, simplicity, and poverty into a more precise metaphysical framework. Once again, the idea of beauty is representative of these semantic shifts. In some Franciscan texts such as in the *Legenda maior* and *De perfectione evangelica*, the semantic field of beauty is found in

¹'Haec est illa celsitudo altissimae paupertatis quae vos carissimas sorores meas heredes et reginas regni caelorum instituit pauperes rebus fecit virtutibus sublimavit' (Clare of Assisi 1887: VIII, 2).

²'Putabant homines quod uxorem ducere vellet ipsum que interrogantes dicebant: uxorem ne ducere vis Francisce. Qui respondens eis aiebat: nobiliorem et pulchriorem sponsam quam umquam videritis ducam quae caeteris forma praemineat et sapientia cunctas excellat' (Thomas of Celano 1941: III, 7).

relation to the moral value of a way of life ordered in conformity with the life of Christ, according to an *imitatio Christi* exemplified by Francis.

In the *Legenda maior*, Bonaventure recalls the episode in which, during a journey to Siena, Francis was greeted by three poor women, an episode interpreted as a sign that Francis had the *perfectio evangelica*. The evangelical perfection in Francis is a particular state of grace that is also visible outwardly because Bonaventure emphasizes the kind of beauty emanating from him:

Clearly, it would seem that through those three poor women so alike in appearance, offering such an unusual greeting, and disappearing so quickly, the beauty of Gospel perfection, consisting in poverty, chastity, and obedience was fittingly revealed to be shining perfectly in the man of God in an equal way. Nonetheless, he had chosen to glory above all in the privilege of poverty which he was accustomed to call his mother, his bride, and his lady³. (Bonaventure 2000: 581)

The appearance of the three ladies shows in an appropriate way (*conveniens*) the beauty (*formositas*) of the evangelical perfection in the man of God. Here Bonaventure not only applies a rhetorical term to beauty (*conveniens*) that indicates the appropriate way in which the three virtues of evangelical perfection appear in the guise of the three women, but also uses the word *formositas*, which has an interesting history in Christian spirituality, if we think, for example, of the *Song of Songs*, where the bride is described as beautiful in the sense of *Formosa*. The evangelical virtues, namely chastity, obedience, and poverty, belong to Francis, but he chooses to privilege poverty, and here, in Bonaventure's text, the allusion to the *formositas* of the *Song of Songs* acquires its full meaning because he underlines that the friar usually calls *Paupertas* not only mother and lady but also his bride.

Therefore, the way of *imitatio Christi* leads to a particular kind of moral and aesthetic beauty, which presupposes the annihilation or debasement of the self in order to overcome pride, as we can read in the *Quaestiones disputatae de perfectione evangelica*. The first question is devoted to the virtue of humility. Bonaventure argues that humility involves the act of debasing oneself. It is also in this context that one can observe another use of the lexicon of beauty to characterize the moral and aesthetic path of the *imitatio Christi*. In the arguments in favor of the humility-debasement nexus, Bonaventure writes:

Again, in Philippians 2: Let your attitude be identical to that of Christ Jesus, though he was in the form of God, etc.; but to empty oneself is nothing else than to debase oneself. Therefore, if we are to imitate Christ in this, self-emptying and debasement are part of evangelical perfection⁴. (Bonaventure 1891a: 117, my translation)

³'Sane per illas tres ut videbatur mulieres pauperulas sic uniformi facie occurrentes sic salutantes insolite sic subito disparentes evangelicae perfectionis formositas quantum ad castitatem scilicet obedientiam et paupertatem satis convenienter ostenditur in viro dei pari forma perfecte fulsisse licet gloriari praelegerit in privilegio paupertatis quam modo matrem modo sponsam modo dominam nominare solebat' (Bonaventure 1941: VII, 6).

⁴'Item, ad Philippenses secundo: Hoc sentite in vobis, quod et in Christo Iesu, qui cum in forma etc.; sed semetipsum exinanire, nihil aliud est quam se ipsum vilificare: si igitur Christum in hoc debemus imitari, exinanitio sui et vilificatio convenit evangelicae perfectioni' (Bonaventure 1891a: 117).

The path to the imitation of Christ passes through the emptying and debasement of the self, which are *convenientes*, i.e., suitably adapted, in the sense of the suitably beautiful, for the achievement of evangelical perfection.

If the moral commitment to evangelical perfection in the imitation of Christ also leads to a kind of moral and aesthetic beauty – which can perhaps be called a ‘poor’ or ‘minor beauty’ – what is the metaphysical foundation of this kind of beauty? To understand this conceptual passage, we can read the splendid pages of the *Itinerarium mentis in Deum*, where Bonaventure grounds the origin of all beauty, in a relational sense, in the Son as *summa aequalitas*⁵.

In the second chapter, describing the beauty (*proportio*) of the creatures observed by the beholder, who experiences pleasure when the object is perceived in an appropriate, harmonious way by the senses – for example, by the eyes (that implies *pulchrum*) or the ears (that implies *suavitas*) –, Bonaventure underlines the reason for the pleasure that results from harmonious proportions⁶. The reason lies in a peculiar relationship, also known as *numerus* or *proportio*, which Augustine had already identified in *De musica*⁷. Retracing Augustine’s path from the sensible to the intelligible, Bonaventure arrives

⁵On Bonaventure’s beauty, see Todisco (2007), Parodi (2007), Solignac (2018), Salvestrini (2023a; 2023b).

⁶See *Itinerarium* II, 5 for the explanation of the different kinds of pleasure concerning the five senses: ‘Now if this perception or apprehension is of an object that harmonizes [with the sense organ], pleasure follows. Further, the senses delight in an object, which is perceived by means of the likeness that has been abstracted from it, either by reason of its beauty, as in the case of vision, or by reason of its sweetness, as in the case of smell and hearing, or by reason of its healthful quality as in the case of taste and touch, to use appropriate terminology. Thus, the cause of all pleasure is proportionality ... there are three ways, in which the senses become aware of the aforesaid proportionality. First, by way of likeness, insofar as shape or form has the nature of beautiful shape or form, and in this case, proportionality is called beauty of shape, because ‘beauty is nothing else but numerical equality’, or a ‘certain arrangement of parts together with pleasing color’. Second, insofar as shape or form has the nature of power or potential, and then proportionality is called sweetness, when the power that is acting is not out of proportion to the recipient, for the senses are pained by extremes but take delight in moderate sensory inputs. Finally, insofar as shape or form has the nature of impressive efficiency. In this case, form or shape is proportional when the agent’s impressive action fulfils a need in the recipient and thereby preserves and nourishes it. This is most apparent in the case of taste and touch. Thus, as far as the aspect of pleasure goes, external objects of delight enter the soul by means of a likeness according to the pleasure of three kinds’ (Bonaventure (undated) [*The Journey of the Mind into God*]). Note the borrowing of Augustine’s expression *aequalitas numerosa* (‘numerical equality’ in *De musica* VI, 13, 38), applied here to the sense of sight.

⁷‘M. These beautiful things, then, please by number, where we have shown equality is sought. For this is found not only in that beauty belonging to the ears or in the motion of bodies, but also in the very visible forms where beauty is more usually said to be. Don’t you think it’s only equality [*aequalitas numerosa*] when equal numbers reply to equal numbers in twos, but in ones, when they have a mean place so equal intervals are kept for them on each side?

D. I certainly do.

M. What is it in light itself holding the origin of all colors (for color also delights us in the forms of bodies), what is it in light and colors we seek if not what suits the eye? For we turn away from too great a flare, and we are unwilling to face things too dark, just as also in sounds we shrink from things too loud, and do not like whispering things. And this is not in the time-intervals, but in the sound itself, the light, you might say, of such numbers, whose contrary is silence, as darkness to colors. When, then, we seek things suitable for the way of our nature and reject things unsuitable we yet know are suitable to other living things, aren’t we here, too, rejoicing in some law of equality when we recognize equals allotted in more subtle ways? This can be seen in smells and tastes and in the sense of touch – and for this a long time to follow out more clearly but very easy to explore. For there’s not one of these sensibles doesn’t

at the numbers of judgement, which are immutable epistemological and aesthetic criteria, inner images of eternal reasons:

Perception and pleasure are followed by judgment. And through this judgment one judges not only whether a thing is white or black (for this pertains to a particular sense), and not only whether it is healthful or harmful (for this pertains to the interior sense)—but one also judges and receives an explanation as to why the senses derive pleasure from the sense object. This happens when one looks for the reason why an object is called beautiful, sweet, or wholesome, and finds out that this reason lies in the proportion of equality⁸. (Bonaventure 1891b: II, 6)

The *proportio aequalitatis* is the trace in sensible things of the intelligible criteria underlying the world, of the images that represent metaphysical principles. This metaphysical foundation, according to Bonaventure, is the first ratio of *aequalitas*, i.e., that between the Father and the Son in the intra-Trinitarian relationships:

For all these things are vestiges, in which we can see our God ... Therefore, if all knowable things have the ability to generate their own shape, they openly proclaim that the eternal generation of the Word, the Image, and the Son eternally proceeding from God the Father can be observed in them as in mirrors. Now sensual shape, which gives delight in this way, i.e., as beautiful, sweet, and wholesome, suggests that in that original shape or form, there is that original beauty, sweetness, and wholesomeness, in which is found the highest proportionality and equality in relation to the one who generates it⁹. (Bonaventure 1891b: II, 7-8)

The *summa aequalitas* is, therefore, the origin and the model of all relationships and individual forms of beauty, because it is the first relation of equality, i.e., that between the Father and the Son. In the *ars aeterna*, in the eternal Word of the Son, all things are generated. The origin of the multiplicity of things, then, is in this *summa aequalitas* but, even if the Trinity at the basis of the cosmos and its beauty refers to the unitary principle of God, it is important to emphasize that the intra-Trinitarian relationships describe the relational metaphysical foundation at the basis of a relational cosmos.

please us from equality or likeness. But where equality and likeness, there numberliness [*numerositas*]. In fact, nothing is so equal or like as one and one, isn't that so?

D: I agree completely' (Augustine 1947: 363-364).

⁸'Post hanc apprehensionem et oblectationem fit diiudicatio qua non solum diiudicatur utrum hoc sit album vel nigrum quia hoc pertinet ad sensum particularem non solum utrum sit salubre vel nocivum quia hoc pertinet ad sensum interiorem verum etiam qua diiudicatur et ratio redditur quare hoc delectat. Et in hoc actu inquiritur de ratione delectationis quae in sensu percipitur ab obiecto. Hoc est autem cum quaeritur ratio pulcri suavis et salubris et invenitur quod haec est proportio aequalitatis' (Bonaventure 1891b: II, 6).

⁹'Haec autem omnia sunt vestigia in quibus speculari possumus deum nostrum ... Si ergo omnia cognoscibilia habent sui speciem generare manifeste proclamant quod in illis tanquam in speculis videri potest aeterna generatio verbi imaginis et filii a deo patre aeternaliter emanantis. Secundum hunc modum species delectans ut speciosa suavis et salubris insinuat quod in illa prima specie est prima speciositas suavis et salubritas in qua est summa proportionalitas et aequalitas ad generantem' (Bonaventure 1891b: II, 7-8).

At this point, it is important to emphasize two fundamental aspects for the development of our argument in the next section. Firstly, in the Franciscan texts, one can observe a particular characterization of the beauty implied by the Franciscan *forma vitae* or *perfectio evangelica*, which is shown by the semantic field that includes words such as *sublimis*, *pulchrum*, *conveniens*, *formositas*, etc. The particular kind of beauty associated with poverty and humility can define the limits of what we have called ‘poor’ or ‘minor beauty.’ Secondly, this kind of beauty has a metaphysical foundation, which Bonaventure describes in various texts, such as in the *Itinerarium*, where he defines the origin of all beauty in the *summa* proportion and equality. On the one hand, a metaphysical foundation can be called ‘poor’ or ‘minor’ because it highlights a relational principle that is reflected in beings that are captured not in their substantial being, but in their mutual relations. On the other hand, the very principle of all beauty is the Son, who accepted to lower his divine nature, emptying, annihilating, and debasing himself, according to the same virtue of humility that Franciscans pursue to reach evangelical perfection in the *imitatio Christi*.

Friar Luca Pacioli and the ‘divina proportione’

The case of the Franciscan friar Luca Pacioli of Sansepolcro is very interesting for the purposes of our inquiry. In the framework of the mathematization of knowledge, Pacioli, on the one hand, establishes the principle of divine proportion (*divina proportione*) in a relational sense and, on the other, outlines a particular kind of system of human knowledge, which, according to his metaphysics, can also include *minores* and *viles arts* – or even, in Poliziano’s words, *sordidae ... ac sellulariae* (Angelini 2018).

The treatise *De divina proportione* concerns a particular kind of proportion, the golden *ratio*, or the ‘proportion that has a mean and two extremes.’ According to the divine proportion, the *ratio* of the whole segment to the largest segment is like that of the largest segment to the smallest (Ciocchi 2003). In order to understand the sense in which Pacioli’s metaphysics is a *metaphysica paupera*, it is important to bear in mind the philosophical presuppositions of his divine proportion.

In Chapter 5 of *De divina proportione*, Luca Pacioli underlines the reasons why the subject is suitable (*conveniens*) both for the title of the treatise and for God. After noting that the divine proportion is one, just as God is one, he illustrates the second *convenientia*, which is particularly interesting for our discussion and concerns the Trinity:

The second *convenientia* relates to the Holy Trinity as, just as in God there is one substance for the three persons Father, Son, and Holy Spirit, similarly a selfsame proportion is to be found for three terms. And it can be found in neither more nor less terms, as it will be explained¹⁰. (Pacioli 1956: 21, my translation)

¹⁰‘La seconda convenientia è de la Sancta Trinità: cioè, sì commo in divinis una medesima substantia fia fra tre persone Padre Figlio e Spirito Sancto, così una medesima proportione de questa sorte sempre conven se trovi fra tre termini. E mai nè in più nè in manco se po ritrovare commo se dirà’.

The divine proportion is appropriate to God because, just as the Trinity in its unity concerns the relationship between three terms, namely the Father, the Son, and the Holy Spirit, so the divine proportion is always a relationship between three terms.

Bonaventure's text on *summa proportionalitas et aequalitas* gives us the proper metaphysical meaning of this conceptual passage, which we will discuss in more detail shortly, but which is important to recall here. According to Bonaventure, the relationship between the Father and the Son is a relationship of equality, the first relationship that underlies all relationships in the world. The suitable or harmonious ratios, or *proportiones*, in things reveal a relational beauty of which that of the Son is the metaphysical model. In the above-quoted passage, Luca Pacioli links the idea of proportion to the Trinitarian relationship, as two relational principles at the basis of the world that mirror each other.

In order to better understand Pacioli's idea of the metaphysical foundation of divine proportion, we can examine the metaphysical sense of proportional beauty associated with the Trinity in the reflections of a thinker whom Pacioli quotes in the previous pages, namely Augustine. We will thus see how the metaphysical reflection of the friar of Sansepolcro uses conceptual tools from the Platonic-Augustinian (and Franciscan) tradition to justify his project of mathematizing knowledge.

Luca Pacioli quotes Augustine of Hippo on the creation of the world according to measure, number, and weight, a statement that comes from the Book of Wisdom:

As we said, the sciences and the mathematical disciplines belong to the first degree of certainty; they are followed by all the natural disciplines, and without their knowledge it is impossible to understand the others. In the Book of Wisdom, it is written: 'That all things consist in number, weight, and measure', viz. everything that unfolds in the lower and higher universe is necessarily subject to number, weight, and measure. And Aurelius Augustine, in *De Civitate Dei*, says that the Supreme Maker is to be highly praised for putting in these three things 'things that were not'¹¹. (Pacioli 1956: 9, my translation)

Pacioli is probably quoting Augustine by heart in this passage. One of the passages in *De Civitate Dei* that comes closest to what the Friar of Sansepolcro means is a point in Book XI, where Augustine considers the significance of the symbolism of numbers in the Scripture. At the end of an analysis of the perfection of the number six, Augustine states:

And, therefore, we must not despise the science of numbers, which, in many passages of holy Scripture, is found to be of eminent service to the careful interpreter. Neither has it been without reason numbered among God's praises, 'Thou

¹¹ 'Sonno, como è dicto, le scientie e mathematici discipline nel primo grado de la certezza, e loro sequitano tutte le naturali e senza lor notitia fia impossibile alcun'altra bene intendere. E nella Sapientia ancora è scripto: "Quod omnia consistunt in numero, pondere et mensura" cioè che tutto ciò che per l'universo inferiore e superiore si squaterna, quello de necessità al numero peso e misura fia sottoposto. E in queste tre cose l'Aurelio Augustino in *De Civitate Dei*, dici el Summo Opefice summamente esser laudato perché in quelle "Fecit stare ea quae non erant"'.

fast ordered all things in number, and measure, and weight' [Wisdom 11.20]¹². (Augustine 1886: XI, 30)

But what does Augustine mean by quoting this passage from Wisdom? And why is it important to establish the mathematical foundation of things?

In the Augustinian view, creation by measure, number, and weight gives the world a relational structure that reproduces the Trinitarian articulation (Father-being, Son-knowing, and Spirit-willing). Number establishes unity, measure concerns the relationship between different things, while weight concerns the tendency of one thing to another, specifically to its place or position in the world (Parodi 1984; Bettetini 1994). Therefore, the criteria with which the *Opifex Summus* has created the world are mathematical and relational, because they are capable of establishing iterative unities and their mutual relationships. So, they are the expression of the Trinitarian articulation of the principle of all things and the basis of a cosmos whose elements are considered precisely in their relations.

In *De Trinitate* Augustine specifies the idea of relation as the basis of the trinitarian articulation of God. He observes that in God nothing can be predicated in an accidental sense, so that relation, which according to Aristotelian logic is an accidental predication, is only predicated in an essential sense in the case of God¹³. As some scholars have pointed out, in this way Augustine deified the category of relationship, a metaphysical principle, and a cosmos structure that describes not an ontology but a relational metaphysics, i.e., a *prostilogia* (Parodi 2006: 117–118). The Trinitarian articulation, therefore, expresses an essential relationship: there are not three terms, but there is the relationship between the Father and the Son, while the Holy Spirit is nothing but their relationship, just as – Augustine says in the following pages where he proposes a path through the sensible trinities best known to us to arrive at the divine one – love between lover and beloved is not a third term but the relationship itself; or again just as the inclination towards something, the intentionality of the subject towards the object is not a third term but again the relationship itself. Among the *authoritates* cited by Luca Pacioli, Augustine therefore plays a pivotal role in arguing for the relational and mathematical foundation of all things.

The Augustinian framework of the metaphysical foundation of the divine proportion receives a Franciscan twist, especially in Christocentrism. Pacioli in his *Summa* (1494: 16 r) underlines that just as Christ is incarnate, becoming man while retaining his divine nature, so the divine proportion is like other proportions of its kind while retaining unique properties that make it divine (Ciocchi 2003). In addition to the

¹²'unde ratio numeri contemnenda non est, quae in multis sanctarum scripturarum locis quam magni aestimanda sit elucet diligenter intuentibus. nec frustra in laudibus dei dictum est: omnia in mensura et numero et pondere disposuisti' (Augustine 1955: Book 11, chap. 30).

¹³'Wherefore nothing in Him is said in respect to accident, since nothing is accidental to Him, and yet all that is said is not said according to substance ... But in God nothing is said to be according to accident, because in Him nothing is changeable; and yet everything that is said, is not said, according to substance. For it is said in relation to something, as the Father in relation to the Son and the Son in relation to the Father, which is not accident; because both the one is always Father, and the other is always Son ... Wherefore, although to be the Father and to be the Son is different, yet their substance is not different; because they are so called, not according to substance, but according to relation, which relation, however, is not accident, because it is not changeable' (Augustine 1993: V, 5, §6). See Parodi (2006: 112–113).

analogical nature of reasoning, which is also proportional, this aspect recalls the metaphysical function of Christ, especially in his emptying, annihilation, or debasement while retaining his divine nature. The divine proportion in this sense circumscribes a metaphysics of poverty since it is the principle and origin of all things. In a sense, it is capable of 'emptying' itself by also constituting the structure, always relational, of lower things.

We have seen the idea of divine proportion as a relational metaphysical principle. We can now see how this principle became the basis for the genesis and the creation of things. Luca Pacioli takes this step by relying on Plato's *Timaeus*, known from medieval sources (Calcidius), and Campano's commentary on Euclid's *Elements* (Ciocchi 2003, 2018). According to Pacioli, proportion gives the numerical and relational structure to the regular *polyhedra* that form the basis of the four elements. In particular, the divine proportion constitutes the *duodecedron*, the polyhedron that forms the fifth element (*Virtù Celeste*) at the basis of all the other elements:

The fifth *convenientia* can rightfully be added to the previous ones: as, just as God gives being to the Heavenly Virtue, also called the Fifth Essence, and through it to the other four simple bodies, viz. the four elements Earth, Water, Air, and Fire, and through these to every other thing in nature; then, according to time-honored Plato's *Timaeus*, this holy proportion of ours gives formal being to heaven by yielding it the shape of the body called dodecahedron, or body composed of 12 pentagons, which, as it will be shown later, could not be formed without our proportion. Similarly, it assigns their own shapes to each other element, which in no way coincide with one another: to the fire it assigns the shape of the pyramid, called the tetrahedron, to the earth the cubic shape or hexahedron, to the air the octahedron, and to the water the icosahedron¹⁴. (Pacioli 1956: 21-22, my translation)

The formation of the four elements at the basis of the cosmos thus entails God's bestowal of being on the fifth element, ether, also known as the *Virtù Celeste* or *Quinta Essentia*, constructed by the *duodecedron*. Following the *Timaeus*, Pacioli compares the other elements to the conformation of the other regular *polyhedra*: fire corresponds to the pyramid (*tetradron*), earth to the cube (*exadron*), air to the *octocedron* made up of eight triangular faces, and water to the *icocedron* made up of 20 triangular faces. The shape of each of these solids is the most suited to the nature of the corresponding element, e.g., the triangle that makes up fire increases its mobility, while the cube that structures the earth increases its stability. Furthermore, the proportions of the different solids in relation to the diameter of the sphere that circumscribes them are regular

¹⁴La quinta convenientia se po non immeritamente a le prediecte arogere: cioè, sì commo Idio l'esser conferesci a la Virtù Celeste per altro nome detta Quinta Essentia, e mediante quella a li altri quattro corpi semplici cioè a li quattro elementi Terra, Aqua, Aire e Fuoco e per questi l'essere a caduna altra cosa in natura, così questa nostra sancta proportione l'esser formale dà - secondo l'antico Platone in suo Timeo - a epso cielo attribuendoli la figura del corpo detto duodecedron, altramente corpo de 12 pentagoni, el quale commo de sotto se mostrerà, senza la nostra proportione non è possibile poterse formare. E' similmente a ciascuno de li altri elementi [sua] propria forma aseigna fra loro per niun modo coincidenti, cioè al fuoco la figura pyramide detta tetradron, a la terra la figura cubica detta exadron, a l'aire la figura detta octocedron e a l'aqua quella detta icocedron' (Pacioli 1956: 21-22).

in all cases except for the *icocedron* and the *duodocedron*, which have an irrational ratio based on the golden section.

The cosmos outlined by Pacioli is thus governed by proportions, that is, by relations between different elements, among which the divine proportion has primacy. In order to confirm the peculiar relational nature of Pacioli's metaphysics, I believe it is useful to observe the kind of argumentation found in his pages, namely analogy. This is an argumentative form that has at its core precisely the structure of proportionality (or *proportionalitas*, to use the medieval technical term), namely a similarity of relations such as $a:b = b:c$ (Perelman & Olbrechts-Tyteca 1971; Parodi 2006), but which, far from having demonstrative force, is one of the most interesting rhetorical forms of argumentation, widely used not only in the *Timaeus* but also in the Augustinian tradition.

Proportion as the principle and structure of the cosmos also governs human activities. It is this last aspect of Pacioli's metaphysics, and its implications for the human world, that I would like to recall here since it is thanks to mathematical structuring that those arts traditionally considered *minores* or *viles* acquire full dignity in the reflection of the friar from Sansepolcro.

We can distinguish two areas of Pacioli's operation of dignifying the arts: the drawing arts, and the *viles* or mechanical arts. As regards the first area, Pacioli's operation is close to other operations of his time, such as those of Leon Battista Alberti and Leonardo da Vinci, in that it aims to raise the *arti del disegno* (drawing arts), namely painting, architecture, and sculpture, to the same dignity as the liberal arts¹⁵. In this context, it is very interesting to recall the dispute evoked at the beginning of *De divina proportione* (Pacioli 1956: 15 ff)¹⁶ in which both Pacioli and Leonardo pointed out that painting (*prospective*, in this context) must attain the dignity of the liberal arts because of its mathematical foundation, otherwise, music should not be included among the liberal arts either, since it is based on the same harmonic relationships that lead to pleasure in the observer or listener¹⁷. A similar argument, with a slightly different purpose, can be found in Alberti's *De re aedificatoria* for architecture, which is based on the same relational proportions as music (Alberti 1988; Di Stefano 2000), and in Leonardo's *Trattato sulla pittura*, which proclaims the superiority of paintings for reasons similar to Pacioli's text, namely its mathematical foundation and the primacy of the sense of sight (Leonardo da Vinci 1964 [First Part]; Ciocci 2014; Winternitz 1970).

On the other hand, in accordance with his metaphysical perspective and perhaps with his Franciscan inspiration, Luca Pacioli includes in the mathematical dignity all the human activities, all the arts, not only those of the *trivium* and *quadrivium* but also

¹⁵For an outline of systems of knowledge and a comparison of the arts between the Middle Ages and the Renaissance, see Salvestrini (2024a).

¹⁶See Ciocci (2014); Ferrari (2017).

¹⁷'Ma el nostro iudicio ben che imbecille et basso sia, o tre o cinque ne constringne, cioè Arithmetica Geometria e Astronomia escludendo la Musica da dicte per tante ragioni quante loro da le cinque la Prospective, e per tante ragione quella agiognendo a le dicte quatro per quante quelli a le dicte nostre tre, la Musica'.

'But, our judgement, as imbecile and low as it is, admits either three or five [liberal arts], namely, either we include Arithmetic, Geometry, and Astronomy to the exclusion of Music for as many reasons as they give for excluding Perspective from the five, so we must add Perspective to the four by the same reasons they add Music to our three' (Pacioli 1494: 2 v, my translation).

those traditionally considered as *minores* and *viles*, namely tailoring, carpentry, ship-building, ironworking, commerce, military strategy, etc. (Pacioli 1494: 45ff, 56 ff; Ciocchi 2003). As we can see both in the *Epistola* to Guidobaldo da Montefeltro and in d. 6, tr. 1, a 2 of his *Summa de arithmetica, geometria, proportioni et proportionalitas*, mathematics and proportions are central to all human knowledge: all the sciences and arts are governed by proportions, from astrology to painting, architecture, and the mechanical arts. For example, in the art of commerce, the elimination of number and calculation would eliminate all its operations; in the *arte militare*, the construction of all artillery and defensive devices (such as bastions, bombards, fortresses, and towers) involves the use of proportions (Pacioli 1494: 2 v). Similarly, a woodworker could not do without the knowledge of proportions, just as a shipbuilder would need it to build boats, sails, and oars (Pacioli 1494: 69 r). Pacioli continues and concludes his discourse on the mechanical arts by returning once again to the metaphysical foundation:

Weavers, wool-makers, and ultimately all other craftsmen always work with due proportion in order to do their work well ... It follows that in all questions, reasons, and cases of the world, due proportion is sought in number, weight, and measure¹⁸. (Pacioli 1494: 69r, my translation)

Proportion as a principle, and the golden *ratio* in particular, is thus the metaphysical foundation of a cosmos, whose primary forms, the regular solids, structure the five elements from which all things derive. Human activities, both the sciences and the arts, whether arts of design or mechanical arts, are fully embedded in this relational metaphysical framework. Pacioli thus outlines a *metaphysica paupera* based on a minor proportional beauty, we might say, since it is capable of encompassing within itself, and, like Christ, of 'lowering,' even the humblest of human activities.

Concluding remarks

In our discussion, we have considered the constitution of the metaphysics of poverty through the theme of beauty in three fundamental stages. First, in early Franciscanism and in the early biographers of Francis of Assisi, we have seen how poverty, especially when it is personified, but also when it is a dimension of the form of life, is often related to beauty.

Second, the theme of minor and poor beauty in Bonaventure appears on various levels, but in these pages, we have seen how its concrete dimension, linked to the form of life aimed at achieving evangelical perfection, receives a metaphysical foundation in the idea of *proportio*, which unites in a harmonious way everything that touches the senses and arouses pleasure, and in the fundamental idea of the *summa proportio et aequalitas* of the Son in the intra-Trinitarian relationship. In this way, a *metaphysica paupera* is defined both by its relational character and by the connection between beauty, poverty, and humility.

¹⁸ 'Li tessari e lanari e finalmente ciascuno altro artifice sempre lavora con debita proportione suo lavoro a star bene ... Unde in tutte le domande e ragioni e casi del mondo si de numero, peso, e misura, sempre se cerca la debita proportione'.

Finally, Luca Pacioli highlighted the central role of the *divina proportio* both as a metaphysical principle of things – relational in that it is closely linked to the Trinitarian articulation – and as the foundation of the creation of the world. The regular solids that structure the five elements are governed by proportions among which the golden *ratio* is predominant, so much so that it gives form to the fifth element, the condition of all the others. The same relational metaphysical framework provides the conditions of possibility for a mathematization of knowledge that includes the liberal arts, the arts of design, but also the mechanical arts, which at this point rise to full dignity among the others. To the *metaphysica paupera* derived from Augustin and found in Bonaventure, Pacioli adds the humanist intention of overcoming the traditional division of knowledge, even going beyond, in a different way, the similar proposals by Alberti and Leonardo.

Some concluding remarks can thus be made on the passage from the Middle Ages to the Renaissance in a Franciscan context. On the one hand, it is possible to highlight the persistence of a model of beauty as proportion and of a relational metaphysics based on a Trinitarian articulation derived from Augustinian thought; on the other hand, a meaningful variation of the idea of beauty as proportion, capable of encompassing all spheres of being and knowledge, even the lesser, poorer, and humbler ones, can be ascertained. Therefore, in a humanist context, we can see how, thanks to Pacioli, the idea of a minor beauty that extends to human activities is constituted, a minor beauty that is also capable of giving a new meaning to a *metaphysica paupera*.

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