

Almada Negreiros and Le Corbusier

Parallel Methodologies and Critical Reception

Simão Palmeirim

Abstract

The French-Swiss artist and architect Le Corbusier (1887–1965) created a system for architects and engineers to humanize the metric system, paving the way for a new form of architecture. The Portuguese artist José de Almada Negreiros (1893–1970) developed a multifaceted literary and artistic practice, progressively constructing a theory on the relation between art and geometry. There are parallels between these two artists in the way they devoted themselves to geometry and developed a theory with a universalistic approach that extended beyond their artistic

production. Le Corbusier's international recognition has led to extensive research and dissemination of his works, whereas Almada's theoretical studies on geometry and art have only recently been the object of systematic research. Recently found documents in Almada's estate shed new light on the author's knowledge of Le Corbusier's *Le Modulor*, and his critical reception of such work. This paper reveals these documents and examines them in depth to identify both parallels and a structural, theoretical divergence between these authors.

New documents

[1] Le Corbusier, pseudonym of artist and architect Charles-Édouard Jeanneret-Gris (1887–1965),¹ created a method intended to humanize the metric system for architects and engineers, combining classic geometry and modern anthropometry.² In 1947 he registered the grid that underpinned this system under the name Modulor, publishing it in a homonymous book in 1950, which he developed further in *Modulor 2*, published in 1955. As an architect, he implemented the system in his works, aiming towards a universalistic architectural language. The Modulor attempted to harmonize architecture with the human scale, under a geometrical principle defined by the author.

[2] The Portuguese pluridisciplinary artist Almada Negreiros (1893–1970) developed a prolific practice in literature – with poetry, essays, plays, manifestos and a novel – and the visual arts – with drawings, paintings, frescoes, or glassworks.³ From an early age he sought to learn how geometry could provide knowledge on specific works of art. This interest led him to engage with geometrical abstractionism, but also to produce a theoretical discourse on the importance and universality of geometry for several cultures from different periods and geographies. Under the title "Relation 9/10", Almada defined a geometrical canon, which, as we will see, resonates with Le Corbusier's Modulor. The Portuguese author never compiled or published his theory, but recent research indicates that it is a voluminous body of work that still deserves critical reading and publication.⁴

[3] Affinities between Le Corbusier and Almada Negreiros are easily established: in their visual work, they both use geometry to explore proportions, symmetries and numbers. Moreover, their practice is accompanied by the development of a theory that stems from geometry, with a universalistic approach that extends beyond their artistic production. Based on recently found documents, in this paper I will explore complementary aspects of their works, present specific parallels in their geometrical methodologies, and point out a conceptual divergence in their theoretical frameworks that becomes apparent in Almada's critical reception of *Le Modulor*.

[4] In Book II of the treatise *De architectura*, Roman architect Vitruvius (c. 80–15 BCE) describes the ideal human body proportions, framing them within a square and a circle. The most widespread representation of this description (from c. 1490) is by Leonardo da Vinci (1452–1519), but there are other relevant drawings of the commonly called Vitruvian Man. Another architect, Cesare Cesariano (1475–1543) translated into Italian, illustrated and published Vitruvius' work in

¹ In the articles published in the magazine *L'Esprit Nouveau*, the French-Swiss author uses a double identity, signing as Charles-Édouard Jeanneret for those on painting and as Le Corbusier-Saugnier for those on architecture. In the book *Vers une architecture* (Paris 1923), a compilation of the magazine's architectural articles, he signed as Le Corbusier-Saugnier, but the second surname was deleted in successive reprints.

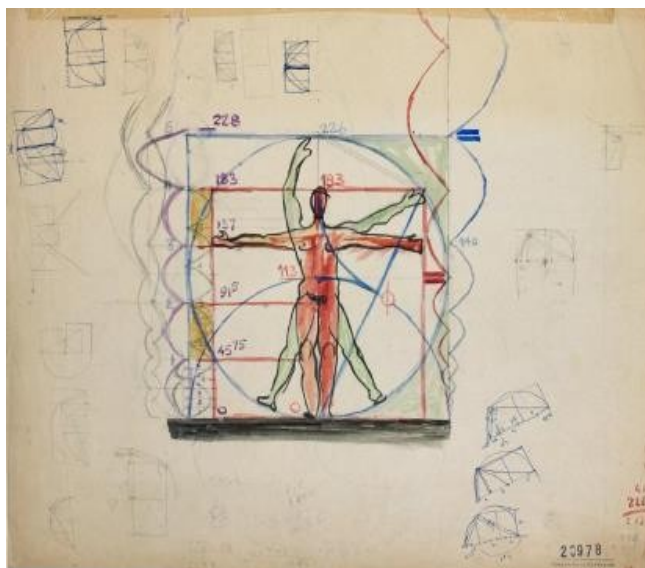
² Lurdes Figueiral, *Da beleza buscada à beleza construída – medidas e formas de beleza*, Oporto 2011, 299.

³ For a complete chronology of the author's life see: Luís Manuel Gaspar, "Cronologia", in: Mariana Pinto dos Santos, ed., *José de Almada Negreiros: Uma maneira de ser moderno*, exh. cat., Lisbon 2017, 385-410.

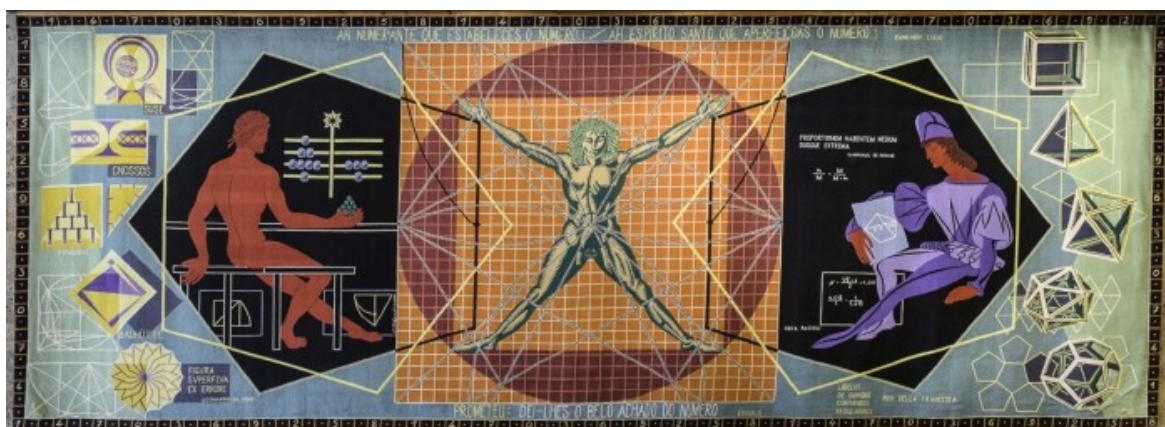
⁴ Simão Palmeirim and Pedro Freitas, *Almada Negreiros e o Mosteiro da Batalha*, Lisbon 2021.

1521 under the title *Di Lucio Vitruuio Pollione de architectura libri dece* (previous editions were in Latin, Cesariano's is the first translation into a language of greater understanding and diffusion).

[5] In a recent publication,⁵ Luís Trabucho points out a relation between Le Corbusier's drawing, inspired by Leonardo's illustration and published in *Le Modulor* (Fig. 1), and Almada's representation at the center of the tapestry *Número*,⁶ inspired by Cesariano's illustration (Fig. 2).



1 Le Corbusier, *Le Modulor*, 1943–1950, drawing (dimensions not available). Fondation Le Corbusier, Paris, FLC-ADAGP (20978) (photo © F.L.C. / SPA, Lisbon, 2024)



2 José de Almada Negreiros, *Número*, 1956, tapestry manufactured at Tapeçarias de Portalegre, wool, 254 × 702 cm. Tribunal de Contas, Lisbon, inv. 5394 (photograph provided by José Vicente / Câmara Municipal de Lisboa)

⁵ Luís Trabucho, *O Número*, Lisbon 2019, 64-69.

⁶ *Número (Number)*, is a 254 × 702 cm woolen tapestry, that was commissioned by the Portuguese Court of Auditors in 1954/55 and has hung in the Tribunal de Contas in Lisbon ever since.

[6] Almada often made reference to artists from distant times in his works, and in a series of interviews with the newspaper *Diário de Notícias*, he mentioned Malevich, Kandinsky, Klee and Mondrian, among others,⁷ contemporaries who also developed an art practice and theory centered around geometrical principles. Besides artists, Almada refers to geometrical theorists such as Ernst Mössel (1881–1946), Matila Ghyka (1881–1965), Jay Hambidge (1867–1924), or Frederik Lund (1863–1943). His personal library included Mössel's *Die Proportion in Antike und Mittelalter* (1926) and Ghyka's *Le nombre d'or* (1952 [original edition 1931]) and *Essai sur le rythme* (1938), and we can see how these readings, particularly Ghyka, impacted Almada's work.⁸

[7] Le Corbusier developed more direct relations with multiple artists, architects, historians and theorists who were actively concerned with proportion applied to artistic practices.⁹ He made clear references to his main sources, namely Auguste Choisy (1841–1909),¹⁰ or Ghyka, who personally sent him a copy of *Le nombre d'or*,¹¹ directly challenged Le Corbusier to deepen his studies,¹² and was later mentioned in *Le Modulor*.¹³ Le Corbusier's public engagement in this field was impactful and widespread at the time. He was in contact with several institutions and organizations, having created his own *Association des Constructeurs pour la rénovation architecturale* (ASCORAL) in 1943, which brought together collaborators from different fields. Moreover, his communication and dissemination campaigns resulted in his 1951 appointment to the presidency of an international committee dedicated to the study of proportion in art.¹⁴ In comparison, Almada's path was an isolated one, with few peers with whom he could exchange views, and with virtually no international impact in this field at the time.¹⁵

⁷ José de Almada Negreiros and António Valdemar, *Almada – Os painéis, a geometria e tudo. As entrevistas com António Valdemar*, Lisbon 2015, 62.

⁸ Simão Palmeirim and Pedro Freitas, "A geometria que Almada leu", in: *Revista de História da Sociedade e da Cultura* 20 (2020), 283-298.

⁹ Jean-Louis Cohen, "Le Corbusier's Modulor and the Debate on Proportion in France", in: *Architectural Histories* 2 (2014), 1-14: 1.

¹⁰ Auguste Choisy, *Histoire de l'architecture*, Paris 1899; see Le Corbusier, "Conférence de Milan", Fondation Le Corbusier (FLC), Paris, U3-10-282 (1951), 2-3. Typescript of the presentation for the "First International Conference on Proportion in the Arts", held as part of the 1951 *Triennale di Milano*.

¹¹ Cohen (2014), 3.

¹² Matila Ghyka, *Esthétique des proportions dans la nature et dans les arts*, Paris 1927.

¹³ Le Corbusier, *Modulor I and II*, Massachusetts 1980, 29, 62-65, 75, 143. *Le Modulor* and *Modulor 2* were first published in 1950 and 1955, respectively.

¹⁴ "One of the conclusions of the Milan conference of 1951 was the creation of the Comitato internazionale di Studio sulle Proporzioni nelle Arti, which immediately elected Le Corbusier as its president." Cohen (2014), 9.

¹⁵ His interlocutors were mainly art critics and historians, namely those involved in an extensive discussion on Portuguese paintings of the 15th century that were first shown in 1910, see Palmeirim and Freitas (2021), as well as architects, particularly those with whom Almada collaborated on public commissions and who shared his interest in proportions.

[8] Both artists mention their self-taught artistic education. Neither of them studied arts in an academic setting. Le Corbusier "had always fled from formal teaching. He therefore had no knowledge of the canonical laws [...]. Being free from the academic spirit, he had an open mind and an alert eye."¹⁶ Almada was similarly proud of being self-taught and felt disconnected from the academy: "modern art found renovation in an ancestry that academic art no longer had eyes to reach".¹⁷ This might have contributed to their respective commitment to a search for specific rules that could serve as a framework for artistic production: their individual, lifelong search for a geometrical canon. Still, without documentation indicating a direct relation between these two authors, any affinities between them could arguably be attributed to what is known as independent discoveries or simultaneous inventions,¹⁸ as the interest in relations between geometry and art was widespread among theorists and artists of the period.¹⁹

[9] However, several recently found documents show that Almada knew Le Corbusier's work, and some of them indicate that the two actually met.²⁰ Written in French, there are two drafts for a letter from Almada to Le Corbusier.²¹ The more complete draft (ANSA-COR-685) states:²²

¹⁶ Le Corbusier (1980), 29.

¹⁷ Unless otherwise stated, all translations are mine. The original reads: "a arte moderna foi renovar-se numa antiguidade que a arte académica já não tinha olhos para alcançar". Almada Negreiros and Valdemar (2015), 65.

¹⁸ Usually this is associated with scientific discoveries, but it has been argued that this also happens in other areas of knowledge, such as art: David Lamb and S. M. Easton, *Multiple Discovery: The Pattern of Scientific Progress*, Amersham 1984, chapter 9: "Originality in art and science", 131-144.

¹⁹ See Cohen (2014), 1-14, or Magdalena Dabrowsky, "Geometric Abstraction", in: *Heilbrunn Timeline of Art History* (October 2004), http://www.metmuseum.org/toah/hd/geab/hd_geab.htm (accessed February 15, 2023).

²⁰ In a letter to his wife Sarah Affonso dated 12 May 1956, Almada states he visited Le Corbusier's *Ville Radieuse* in Marseille. Sarah Affonso Ferreira, "As viagens de Almada", in: Santos (2017), 41-48: 47. The new documents date Almada's reference to Le Corbusier's works four years earlier and provide new information.

²¹ It is uncertain if such a letter was ever sent. In 2021, at my request, Arnaud Dercelles, responsible for the *Centre de documentation et de recherches* at the *Fondation Le Corbusier* in Paris, searched the centre's database and found no reference to Almada Negreiros.

²² Documents with the reference ANSA are part of the [CEDANSA archive](#) (Almada Negreiros and Sarah Affonso Study and Documentation Center) at Universidade NOVA de Lisboa, FCSH (Faculty of Social and Human Sciences), and can be found in www.modernismo.pt. See Almada Negreiros, draft letter to Le Corbusier, undated (after 1952). CEDANSA – NOVA FCSH, Lisbon, ANSA-COR-685 (© Estate of José de Almada Negreiros); <https://modernismo.pt/index.php/arquivo-almada-negreiros/details/33/4111>.

Dear Sir,

I had no knowledge of your book "Le modulator" until April 10 1952. [...]

I was very surprised to see in the book that the whole world is far from the path to a solution that you are trying out there.

It just so happens that one year before my reading of "Le modulator", I was in Paris with my dossiers under the title "La relation neuf-dix", and if I was not able to find someone to show them to, that is perfectly explained by not having had the time due to a surgical procedure [...] that was the real purpose of my trip.²³

Almada continues by writing of how he had been researching these matters since 1925, gives some examples of the historical and cultural references of his work and tries to cut the letter short: "I won't name other examples in this first letter."²⁴ He then adds notes on why he considers the Relation 9/10 – the geometrical tracing he identifies as canonical – as being of the utmost importance, and finishes by stating "I am a painter. I met you personally in Madrid."²⁵

[10] It is new, and relevant to know, that the two had met previously. This was possibly in 1928, when Le Corbusier visited Madrid for two lectures at the *Residencia de Estudiantes*.²⁶ At this time Almada was engaged in several collaborations and public works, particularly working with architects, during an overall prolific stay in the city (1927–1932). It is also around this period that Almada claims to have identified the first manifestations of the Relation 9/10. It is not likely that the two artists were able to exchange views on the subject subsequently, otherwise this would most likely be documented.

[11] It is only in the 1950s that the geometrical tracings used by Almada in his studies change significantly, coinciding with the incorporation of his theoretical research in his visual works.²⁷ This is why this document, indicating he read *Le Modulator* in 1952, is so relevant. We know that in the late 1940s he was researching on the subject, because there are two publications on it, from 1948 and 1950;²⁸ but these were timid attempts to make his work public. In the late 1950s he uses geometrical abstraction for the first time in four paintings dated 1957, and only in 1960 he publishes a full-length explanation of his views (in the form of interviews to *Diário de Notícias*). I posit that reading *Le Modulator* had an impact on Almada's renewed enthusiasm for the

²³ Written in French, with some grammatical errors, the original reads: "Cher Monsieur, Je ne connais l'existence de votre livre "Le modulator" que depuis le 10 Avril 52. (...) J'ai été bien étonné de voir que, dans le livre, tout le monde est dehors le chemin d'une solution que vous y essayez. Or, il est arrivé qu'une année avant ma lecture de "Le Modulator" j'ai été à Paris avec mes dossiers sous le titre "La relation neuf-dix", et si je n'ai pas trouvé à qui les proposer, cela s'explique parfaitement par ne pas avoir eu du temps, à cause d'une intervention chirurgicale (...) et cela à été le vrai bout de mon voyage."

²⁴ The original reads: "Je ne vous nommerai d'autres exemples dans cette première lettre."

²⁵ The original reads: "Je suis peintre. Je vous ai connu personnellement à Madrid."

²⁶ Salvador Guerrero López, *Le Corbusier, Madrid 1928. Una casa – un palacio*, exh. cat., Madrid 2010.

²⁷ Simão Palmeirim, "Questões metodológicas de um retábulo imaginado", in: António Valmar et al., *Almada Negreiros e os painéis. Um retábulo imaginado para o Mosteiro da Batalha*, exh. cat., Lisbon 2021, 10-12.

²⁸ José de Almada Negreiros, *Mito – alegoria – símbolo*, Lisbon 1948, and *A chave diz*, Lisbon 1950.

theoretical and practical implications of geometry in art. Moreover, the importance of this defining moment can now help to understand hundreds of further writings (in both Portuguese and French) and drawings by Almada, and not least to date them and reach a critical contextualization of their intention. That is not to say his research was not already informed and constantly evolving. In fact, as will be discussed below, Almada did not passively assimilate Corbusier's ideas, and he was even critical of some of the content stated in *Le Modulor*.

[12] In another manuscript (ANSA-C-307) Almada writes:

I have just read [...] Modulor [...]. The book's print date is March 1, 1950.

This same year, May 5, I registered in my name at the Literary and Artistic Property, National Library of Lisbon, the Reconstitution of the St Vincent altarpiece in the Lisbon See, by way of reduction to perfect number [...].

We offer these dates with which we dispense with "the word of honor" in this century of ours in which honor has not ended but does not prevail [...].²⁹

Almada's need to register formally the authorship of his propositions on the reconstitution of an altarpiece is likely connected with controversies in which he was previously involved: Almada and a Portuguese art critic had a public falling out, in 1926, as they both claimed to have discovered an important new element towards understanding a set of six Portuguese paintings from the 15th century. This was his first geometrical study of artworks, one he would include decades later into his vision of the altarpiece's reconstitution.³⁰ The 1926 episode would also explain his reference to a century in which honor "does not prevail". What is relevant here is the fact that Almada also felt the need to make it clear that in 1950 – therefore before reading Le Corbusier's work – he was already working on intricate geometrical propositions, based on a notion of "perfect number" that I will address later on. This would be self-evident, considering he had already published work on the subject in 1948 and 1950, but this text shows that Almada felt the need to reaffirm that his research was already underway and was coincidentally published in the same year as Le Corbusier's

²⁹ Almada Negreiros, "Dórico / Cãnone da ingenuidade" notebook, 1952. CEDANSA – NOVA FCSH, Lisbon, ANSA-C-307 (© Estate of José de Almada Negreiros); <https://modernismo.pt/index.php/arquivo-almada-negreiros/details/33/5446>. The original reads: "Acabo de ler [...] o Modulor [...]. O livro tem a data d'impressão 1 de Março 1950. / N'este mesmo ano, a 5 de Maio, registei em meu nome na Propriedade Literária e Artística, Biblioteca Nacional de Lisboa a "Reconstituição do altar de S. Vicente na Sé de Lisboa, pela redução a número perfeito [...]". / Damos estas datas que nos dispensam "a palavra de honra" n'este nosso século em que a honra não acabou mas não impera [...]."

³⁰ These paintings, the St. Vincent panels, were discovered in 1882 and gave rise to many discussions in Portugal throughout the 20th century. Today these paintings can be seen in the National Museum of Ancient Art in Lisbon. The reconstitution of the altarpiece, consisting of fifteen paintings, was something that occupied Almada for many years of his life. Today, his ideas on the subject are mostly rejected by art historians, but he was responsible for important advances in understanding some of those paintings. For more see Palmeirim and Freitas (2021).

Le Modulor. It is truly unfortunate that we do not know whether Almada's aforementioned letter was ever sent, or whether the artists ever communicated directly again after Madrid, because as the text in ANSA-C-307 shows – and as I will try to demonstrate – their works did evolve in parallel.

[13] In another draft for a letter to Le Corbusier (ANSA-COR-686),³¹ Almada reiterates that an architect friend had given him *Le Modulor* as a gift.³² Here, the Portuguese artist recounts his surprise on reading the book and realizing that Le Corbusier was not familiar with "what the Greeks called *antigraphie*. [...] The art of *antigraphie* is the most ancient of the arts [...]."³³ It is a very incomplete draft, but it shows that Almada was inclined to engage in a meaningful exchange of ideas with Le Corbusier or, at least, to try to show him that there were elements he felt were missing in the latter's research.

[14] In addition to the letter drafts, other documents reveal Almada's analysis of Le Corbusier's proposition for the "place of the right angle",³⁴ quoting the architect, commenting on his conclusions and pointing out potential geometrical mistakes (though these points of criticism are never fully developed). However, as I will demonstrate, it is not geometry that is at the center of Almada's critical reception in these documents, but rather a theoretical approach: the core of Almada's disagreement with Le Corbusier lies in the positioning of specific concepts in a broader theory of knowledge. The next two sections of my essay reflect this difference between Le Corbusier and Almada: The chapter "Parallel methodologies" focuses mostly on geometrical elements of the artists' works that have common or discrepant characteristics; the following one, "Critical reception", focuses on a more structural divergence that stems from Almada's reading of *Le Modulor*.

³¹ Almada Negreiros, draft letter to Le Corbusier, undated (after 1952). CEDANSA – NOVA FCSH, Lisbon, ANSA-COR-686 (© Estate of José de Almada Negreiros); <https://modernismo.pt/index.php/arquivo-almada-negreiros/details/33/4112>.

³² It would be interesting to understand exactly who it might have been; possibilities include Porfírio Pardal Monteiro, Carlos Ramos, Jorge Segurado, José Cortês, among others. These names were kindly suggested by João Rodeia, who is studying Le Corbusier's impact on Portuguese architects in his ongoing doctoral thesis.

³³ The original reads: "ce que les Grecs appellaient antigraphie. L'art de l'antigraphie, est le plus ancien des arts [...]." "*Antigraphie*", or "*antegrafia*" in Portuguese, is a term Almada borrows from Francisco de Holanda (1517–1585), specifically, from his *Da Pintura Antiga*. Almada presents his interpretation of the word in José de Almada Negreiros, *Ver*, Lisbon 1982, 75-77: "*Antegrafia*, as the word says, is anterior to all script [writing, or inscribing, from the Greek *gráphō*, "to scratch, to scrape, to graze"]. [...] / all *antegrafia* is readable and of clearer language than any idiom, living or dead." The original reads: "A antegrafia, a palavra o diz, é anterior a toda a grafia. [...] / "toda a antegrafia é legível e de mais clara linguagem que todo o idioma vivo ou morto."

³⁴ "Specifically, for the Modulor the architect focused on two principles: the right angle rule and the golden ratio rule. The right angle rule suggests that a well-balanced composition should contain a collection of naturally inscribed right angles." Natasha Rozhkovskaya, "Mathematical Commentary on Le Corbusier's Modulor", in: *Nexus Network Journal* 22 (2020), 411-428: 8. Le Corbusier refers to this rule as the "place of the right angle" and Almada quotes this expression directly in ANSA-L-261, translating it into Portuguese.

Parallel methodologies

[15] Almada describes his own geometrical canon – the Relation 9/10 – in a similar way to how Le Corbusier describes the Modulor. The concept of specific numbers related to a geometrical system, rooted in the human experience and encompassing different cultures, is common to both authors. They both see the canon as a human interpretation of nature, as a code or a language. I propose that the Modulor and the Relation 9/10 are different expressions for the same intention. The following statements by these authors illustrate this:

*Geometry is the language of man.*³⁵

*The 'Modulor' is a measure based on mathematics and the human scale [...] The numbers of the 'Modulor' are measures. That means that they are facts in themselves, they have a concrete body [...] But the manufactured objects whose dimensions these numbers are to determine are either containers of man or extensions of man.*³⁶

Canon and relation 9/10 are one and the same. The relation 9/10 is a constant of the Canon. Throughout the history of Number [...] there have been several expressions, several words that mean the Canon. [...]

*Canon is not the work of man, it is man's possible grasp of immanence. [...] Geometry is [...] the perfect system prior to man's purpose in knowledge.*³⁷

Le Corbusier considers the measurements of the Modulor as a "fact in themselves"; however, they determine the characteristics of objects that are an "extension" of man. This is how geometry is perceived as "the language of man": the Modulor is a vocabulary for human expression. Almada presents the Relation 9/10 as an expression of a canon which has had other "expressions", other "words", other signifiers in the past. My argument is that the Modulor, for Almada, is one of those signifiers, just like the Relation 9/10 is his own, new, "word" for "the Canon".

[16] The possibility for application of a canon is really where they differ. Le Corbusier is more inclined towards a practical vision, he leaves a legacy that allows for the direct application of his Modulor (mainly in architecture), whereas Almada is more interested in proving its presence in multiple artistic manifestations and trying to systematize a theoretical framework for its existence; the only application he considers is in his own art practice, as the expression of his studies.

³⁵ Le Corbusier, *Towards a New Architecture*, New York, NY 1986, 74. First published in Paris in 1923 under the title *Vers une architecture*.

³⁶ Le Corbusier (1980), 60.

³⁷ The original reads: "Cânone e relação 9/10 são uma e a mesma coisa. A relação 9/10 é uma constante do Cânone. Através da história do Número [...] tem havido várias expressões, várias palavras que significam Cânone. [...] O Cânone não é obra do homem, é a captação que o homem pode da imanência. [...] Geometria é [...] o sistema perfeito anterior ao desígnio do homem no conhecimento." Almada Negreiros and Valdemar (2015), 67-71.

[17] Both authors seek to consubstantiate the universality of the canon with the same strategy, by pointing out its recurrence in various cultures from different times and geographies. There are parallels in the examples used, from ancient non-European civilizations to classical antiquity and the Italian Renaissance, encompassing authors from disciplines such as mathematics, architecture or philosophy.

[18] Almada claims he first recognized the Relation 9/10 in the architecture of a Greek devotional temple to Apollo in Delphi, and that this happened in Madrid in 1928 while reading a Spanish-language *History of Art*.³⁸ In the artist's estate there are many drawings with geometric analyses of the façade of this temple.³⁹ For its part, the seventh chapter of *Le Modulor* is devoted to "concrete verifications" and shows a list of several measurements that a young Le Corbusier had taken of architectural structures in 1910, including a temple devoted to Apollo in Pompeii and the Parthenon. Both authors thus evoke an encounter with Greek ancient culture as a foundational moment in their research chronologies.⁴⁰

[19] Equally common to both authors is an endeavour to organize and publish retrospective chronologies of their research. Le Corbusier does so in the second chapter of *Le Modulor*, under the heading "Chronological review", and Almada in an article for *Diário de Notícias* in 1958, and in the following years he continued to produce such chronologies but without publishing them.⁴¹ It should be stressed that, in Almada's case, we can find discrepancies concerning dates and details in different documents, because he did not keep diaries or logs of his research throughout his life. I would argue that these retrospective efforts signal attempts by the authors to leave a testimony of the length and depth of their enquiries, so as to protect them from potential criticism in the future.

[20] A further commonality between the authors is the attention to graphic design in their literary production, particularly as it often crosses disciplines (both artists also published manifestos, conferences and other forms of literature). In the original editions of *Le Modulor* and *Modulor II*, form and content are carefully brought together, a concern that is also evident in Le Corbusier's

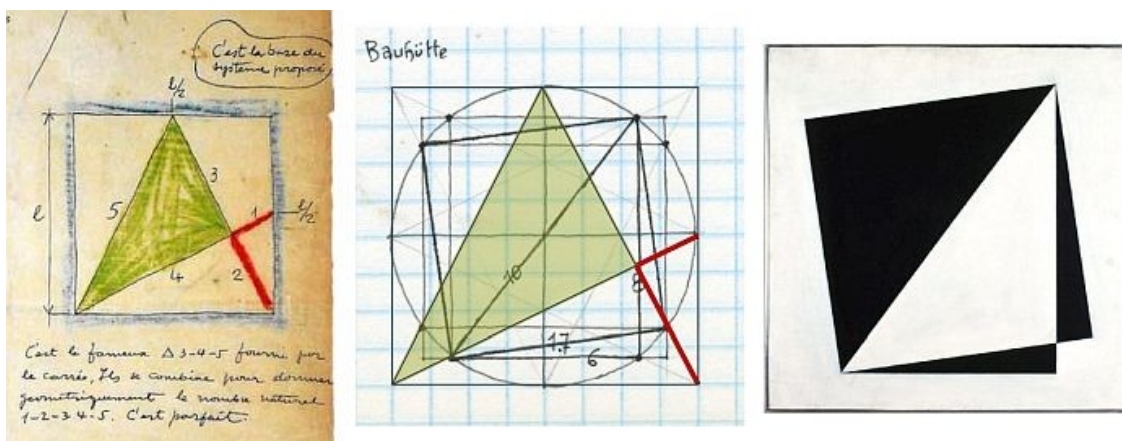
³⁸ This was a widely available set of volumes published by Editorial Labor: *Historia del arte*, 14 vols., Barcelona 1933–1958. Sara Afonso Ferreira, Sílvia Laureano Costa and Simão Palmeirim, *Almada por contar*, Lisbon 2013, 167.

³⁹ In a drawing (ANSA-A-638) exploring the properties of the Relation 9/10, Almada signs "ALMADA / Madrid / 1929". This drawing was published in 1960 (ANSA-RI-266), where the temple is no longer referred to and the geometrical tracings are clearly of a later period. Nevertheless, it is an example of how the author repeatedly refers to his stay in Madrid as the moment of discovery of the Relation 9/10, even if the exact year is not always the same.

⁴⁰ "In Antiquity, the artist is not a creator *ex nihilo*, for what was to be revealed was already there, at a deeper level. [...] The classic genius is not he who invents; it is he who discovers. Le Corbusier put himself in that position." Clara Gonçalves and Maria João Soares, "Le Corbusier: Architecture, Music, Mathematics: Longing for Classicism?", in: *Le Corbusier, 50 Years Later*, Valencia 2015, 844-861: 853. This idea resonates with Almada's previously quoted position regarding the Canon as not the work of man, but man's possible grasp of immanence.

⁴¹ Palmeirim and Freitas (2021), 154-156.

The Poem of the Right Angle. This work, produced between 1947 and 1953 and composed of lithographs and illustrated poems, is generally considered a synthesis of his personal reflections.⁴² In parallel, the sense of Almada's futuristic leaflet *K4, O quadrado azul*⁴³ "depends on its shape and graphic composition as much as on the words it uses".⁴⁴ His artist's book *Orpheu 1915–1965*,⁴⁵ celebrating an early twentieth-century collaborative movement that involved several Portuguese artists, is another possible example among many.



3 (From left to right) Le Corbusier, illustration in *Modulor II* (p. 55), 1955. Fondation Le Corbusier, Paris, FLC-ADAGP 32285 (© F.L.C. / SPA, Lisbon, 2024) | Adaptation of a detail of Almada's drawing in notebook 9,10, undated, CEDANSA – NOVA FCSH, Lisbon, ANSA-C-30 (© Estate of José de Almada Negreiros) | Almada Negreiros, *Ponto de Bauhütte*, 1957, oil painting on canvas, 60 × 60 cm. Calouste Gulbenkian Foundation, Lisbon, inv. 83P64 (© Calouste Gulbenkian Foundation)

[21] Let us now focus on geometrical issues. In the context of a comparison between the Modulor and the Egyptian cubit, Le Corbusier presents a drawing⁴⁶ where a triangle is inserted in a square (Fig. 3, left). The triangle in green is inscribed with the proportions 3 – 4 – 5, proportions that prove the Pythagorean theorem using the smallest natural numbers. This can be related to one of Almada's most recurrent drawings, called *Bauhütte Point*, a geometrical construction based on his interpretation of a medieval poem, as if it were a geometrical problem. It is in Ghyka's *Le nombre d'or* that he had read the poem:

⁴² First published in book form in 1955 in a limited edition: Le Corbusier, *Le Poème de l'angle droit*, Paris 1955.

⁴³ Which translates to *K4, The Blue Square*. First published in 1917 by Almada Negreiros and Amadeo de Souza-Cardoso as editors, ANSA-IMP-5 in www.modernismo.pt.

⁴⁴ Fernando Cabral Martins, "O disparo dos fotógrafos", afterword in: Almada Negreiros, *Ficções*, Lisbon 2017, 263-280: 274.

⁴⁵ Almada Negreiros, *Orpheu 1915–1965*, Lisbon 1965.

⁴⁶ Le Corbusier (1980), 55.

*A point in the circle / That can be placed in the square and in the triangle. / Do you know the point? all is well. / Do you not know it? all is lost.*⁴⁷

This led him to search for a triangle and a square, both inscribed in a circle and with a common vertex. The poem does not indicate the type of triangle one should use, but Almada as an avid reader of studies on classicism deliberately chooses the 3 – 4 – 5 triangle.⁴⁸ In Fig. 3, center image, Almada inscribes each number's double (6 – 8 – 10), as he is trying to establish a relation to the proportion 1 – 7, which is also inscribed, but we are looking at two similar triangles. The faint lines in the middle drawing by Almada have been highlighted here to show their correspondence with the lines that determine the green area and the red lines in Le Corbusier's drawing. Beyond the visual parallel between these drawings, the authors have similar intentions. Alongside this drawing Le Corbusier writes:

*In this way the Modulor has been 'integrated' — or 'reintegrated' — in a company of high renown; the company of measures which have dimensioned the works of the past. Following in the line of tradition, the Modulor, in turn, brings to the art of today its fruitful and timely contribution.*⁴⁹

In 1960, when referring to the *Bauhütte Point*, Almada states:

[...] the expression of the Portuguese proverb "paint the seven" and that of the two first verses of the Bauhütte quatrain [...] both have the same geometrical significance.

[...] Prof. Mössel found the Bauhütte quatrain. Meaning: he found in popular tradition what the scholarly way had yet to offer him.

*The same happened with the subject in Portugal: the old Portuguese proverb "paint the seven", which our people still do not distort today, came to whoever was looking for it.*⁵⁰

Le Corbusier sets his drawing against the background of both Egyptian tradition and classical antiquity by referring to Pythagoras; he intentionally integrates the drawing into "the company" of the past, "in the line of tradition". Almada interprets a medieval poem to create his drawing, also opting for a Pythagorean reference, and adds a further layer of "tradition" by relating the drawing to an "old Portuguese proverb".

⁴⁷ Matila Ghyka, *Le nombre d'or*, Paris 1952, vol. 1, 72. Almada's translation from the French version is: "Um ponto que está no círculo / E que se põe no quadrado e no triângulo, / Conheces o ponto? Tudo vai bem. / Não o conheces? Tudo está perdido", as published in Almada Negreiros and Valdemar (2015), 107. See Palmeirim and Freitas (2020), 288.

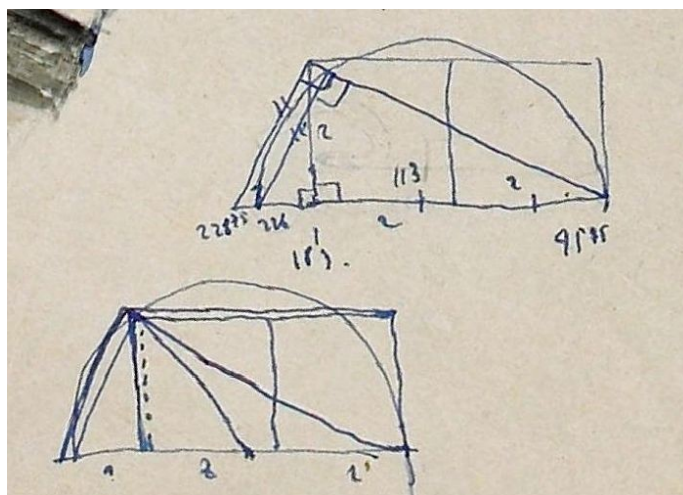
⁴⁸ Giorgia Casara, "Uma biblioteca (para)filosófica. Estudo sobre a Biblioteca Particular de Almada Negreiros e pré-inventário dos livros de interesse filosófico", in: *Orpheu e a filosofia* 11 (2022), 53-94.

⁴⁹ Le Corbusier (1980), 56.

⁵⁰ The original reads: "a expressão do provérbio português 'Pintar o Sete' e a dos dois primeiros versos da quadra da Bauhütte [...] têm ambas o mesmo significado geométrico. [...] Foi o prof. Moessel o achador da quadra da Bauhütte. Quer isto dizer: encontrou na tradição popular o que ainda não lhe fornecia a via erudita. O mesmo se passou com o mesmo assunto em Portugal: veio ao encontro de quem o buscava no antigo provérbio português 'Pintar o Sete', o qual ainda hoje o nosso povo não deturpa." Almada Negreiros and Valdemar (2015), 108.

[22] Both authors are concerned with bringing forth new knowledge while affirming that the originality of their propositions is rooted in cultural traditions of the past. Moreover, they write as if this knowledge works autonomously: "the Modulor [...] brings to the art of today its fruitful and timely contribution" and "the old Portuguese proverb [...] came to whoever was looking for it". I argue that this is yet another way to legitimize their propositions: not only are they anchored in tradition, but they are presented as universal, almost independent from their authors.

[23] A closer look at the small sketches around the main drawing in Fig. 1 reveals similarities between these geometrical tracings and Almada's representation of the Relation 9/10. Le Corbusier's drawings seem to be geometrical exercises for the aforementioned "place of the right angle" of which we can find variations in pages 37 to 50 of *Le Modulor* and pages 44 to 48 of *Modulor II*.



4 Le Corbusier, detail of *Le Modulor*, 1943–1950 (Fig. 1). Fondation Le Corbusier, Paris, FLC-ADAGP (20978) (© F.L.C. / SPA, Lisbon, 2024)

Figure 4 reveals a detail of the drawing in Fig. 1, with the geometrical tracings just mentioned. In this particular case, the diagonal of a double square (a rectangle of proportions 1 to 2) is clearly marked. Le Corbusier applies this geometrical tracing on the central figure of the drawing. In it, the line that unites the green hands of the man (Fig. 1) corresponds to the line that stems perpendicularly from the diagonal of the double square in the sketches. In some sketches, the author writes "90°" to mark the angle; in Fig. 4 he marks this perpendicularity with a small square.

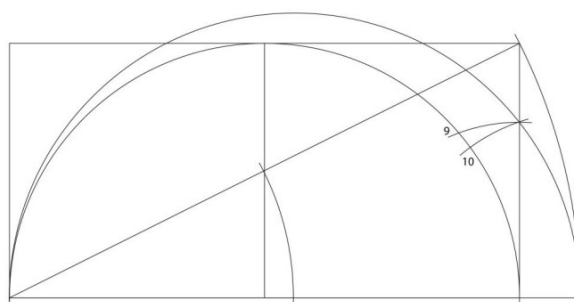
[24] According to Rozhkovskaya, "The central role in the geometric deduction of the Modulor scale is given to the question that was posed by Le Corbusier to his assistant Gerald Hanning".⁵¹ This question was:

Take a man-with-arm-upraised, 2.20 m. in height; put him inside two squares, 1.10 by 1.10 meters each, superimposed on each other; put a third square astride these first two squares. This third square should give you a solution. The place of the right angle should help you to decide where to put this third square.

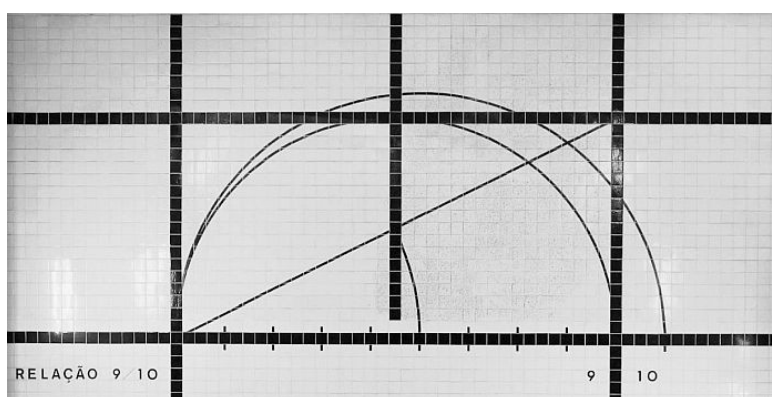
⁵¹ Rozhkovskaya (2020), 9.

The "place of the right angle" stems from that problem.⁵² As explained in *Le Modulor* (pages 37 to 43), Hanning's 1943 response was later revised by Elisa Maillard, and several collaborators eventually worked with Le Corbusier until 1945, when he presented the final results to the Department of Cultural Relations of the French Ministry of Foreign Affairs. An essential characteristic was maintained: setting the right angle within the double square. The problem's rigorous mathematical reconstruction has since been reformulated and tested by several authors.⁵³

[25] Figure 5 illustrates the drawing Almada most commonly uses to represent the Relation 9/10. The drawing determines the ninth and tenth parts of the circle, from the rotation of the diagonal of a double square. A detailed explanation of this construction and the trigonometrical analysis of its propositions (the 9th part is an approximation and the 10th is accurate) has been published.⁵⁴ Another attribute of this geometrical tracing can be identified in the Saldanha metro station in Lisbon (Fig. 6), where 9 and 10 metric divisions are related to the diameter of the circle (these are both approximations).



5 Scheme illustrating the Relation 9/10 geometrical tracing developed by Almada (image provided by the author)



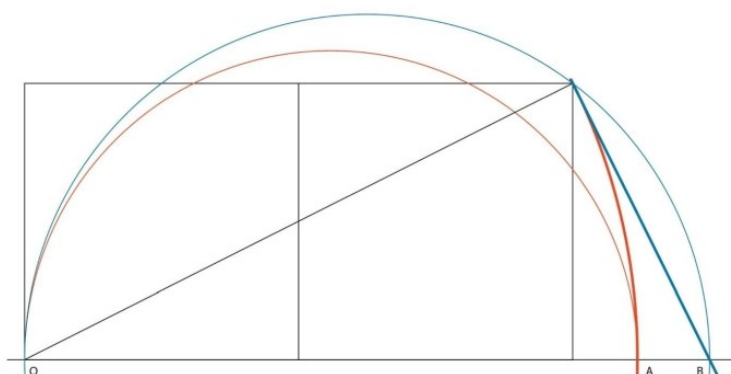
6 A representation of Almada's Relation 9/10 in the Saldanha metro station in Lisbon, by Almada's son, the architect José Afonso Almada Negreiros, 2009 (photograph provided by the author)

⁵² Le Corbusier (1980), 37.

⁵³ Authors such as Figueiral (2011) or Rozhkovskaya (2020).

⁵⁴ Simão Palmeirim and Pedro Freitas, *Livro de Problemas de Almada Negreiros*, Lisbon 2015, 70-72.

[26] The visual connection between the two authors' drawings is recognizable; specifically, the importance of the diagonal of the double square's rectangle. Figure 7 illustrates the different geometrical proceedings: Almada's scheme is in red and Le Corbusier's in blue. In Almada's case, a point of the diagonal is rotated; in Le Corbusier's, a line perpendicular to the diagonal is drawn from the same point. The different results are evident, notably in the diameter of their respective circumferences OA and OB.



7 Comparative schemes of Almada Negreiros and Le Corbusier's drawings (A and B respectively) (image provided by the author)

The most important geometrical tracings for the *Modulor* and the Relation 9/10, therefore, have a common origin. Both authors consider the aforementioned diagonal in relation to a specific common circle. The diagonal occupies the upper half of the circle: two quadrants of the square in which the circle is inscribed.⁵⁵ The two artists work in the same geometrical space and use similar relations between circle and square as they try to define their canon. These relations are extensively explored with different ramifications; Le Corbusier, for example, uses the tangent of the circle to define a succession of right-angled triangles,⁵⁶ and Almada tries to obtain the division of the circle in equal parts,⁵⁷ both always starting from this same geometrical space.

Critical reception

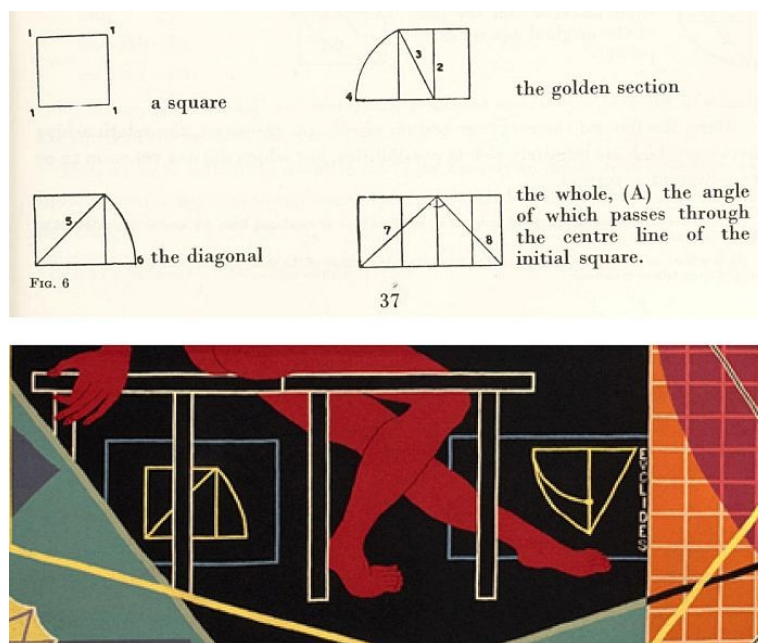
[27] In page 37 of *Le Modulor*, when illustrating how Hanning and himself had arrived at a solution for the aforementioned problem of the "place of the right angle", Le Corbusier offers an image (Fig. 8, top) with a sequence of geometrical tracings: 1) a square; 2) a drawing that allows for the determination of the Golden ratio; 3) a drawing using the rotation of the square's diagonal (for the determination of $\sqrt{2}$ according to the Pythagorean theorem); and 4) the combination of the two previous ones, which would serve the "place of the right angle". The same relation

⁵⁵ From the same year as Almada's *Ponto de Bauhütte* (image on the right in Fig. 3) is his painting *Quadrante I* (which translates to "Quadrant I"). Almada sometimes refers to geometrical elements in specific quadrants, but this is not a terminology he uses often.

⁵⁶ Le Corbusier (1980), 64.

⁵⁷ Not familiar with the Gauss-Wantzel theorem, most of his achievements in this area are approximations, but some are surprisingly close to the exact values; see Palmeirim and Freitas (2015).

between $\sqrt{2}$ and the Golden ratio is shown by Almada in a detail of the tapestry *Número* (Fig. 2, bottom). At the feet of the man using the abacus, under a table, we find the same determination of $\sqrt{2}$ and a different construction for the Golden ratio.⁵⁸



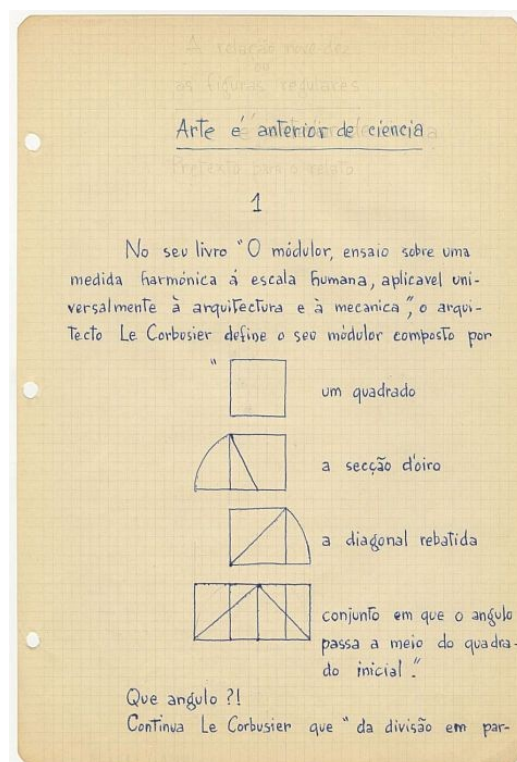
8 (above) Le Corbusier, illustration in *Le Modulor* (p. 37), 1950 | (below) José de Almada Negreiros, detail of *Número* (as Fig. 2), 1956, tapestry manufactured at Tapeçarias de Portalegre, 254 × 702 cm. Tribunal de Contas, Lisbon, inv. 5394

[28] Le Corbusier combines the tracing for $\sqrt{2}$ and the Golden ratio to create his own, new proposition, whereas Almada uses the same two referents on the tapestry,⁵⁹ but keeps them separate. This reflects Almada's critique of Le Corbusier's proposition in a manuscript entitled "Arte é anterior de ciencia",⁶⁰ where he actually copies the sequence of four geometrical tracings from *Le Modulor* (Fig. 9) before questioning Le Corbusier's solution: "[...] the architect Le Corbusier defines his modulor composed by / a square / the golden section / the rotated diagonal / composition where the angle is in the middle of the initial square. / What angle?!"

⁵⁸ There are many known ways to geometrically determine the irrational number commonly associated with the Golden ratio. The one Almada uses is based on Proposition 11, book II, of the *Elements* of Euclid, who is explicitly mentioned next to the geometrical tracing on the tapestry (Fig. 2). The irrational number commonly called "golden" has a value of approximately 1,618 and is also often referred to by the Greek letter ϕ .

⁵⁹ In the same year as Almada's *Ponto de Bauhütte* (image on the right of Fig. 3) and the already mentioned *Quadrante I*, Almada painted two more abstract works, that form a cohesive group of four. One of them is titled *Porta da harmonia* (which translates to "Harmony's door", or "Door to harmony") and uses the rotation of the square's diagonal in its construction. In several of Almada's notebooks, the tracing on the left of the tapestry's detail in Fig. 8 (the rotation of the square's diagonal) is referred to as *Porta da harmonia*.

⁶⁰ Almada Negreiros, "Arte é anterior de ciencia" manuscript, undated (after 1950). CEDANSA – NOVA FCSH, Lisbon, ANSA-L-261 (© Estate of José de Almada Negreiros); <https://modernismo.pt/index.php/arquivo-almada-negreiros/details/33/4681>.



9 José de Almada Negreiros, first page of manuscript "Arte é anterior de ciencia", undated (after 1950). CEDANSA – NOVA FCSH, Lisbon, ANSA-L-261 (© Estate of José de Almada Negreiros)

[29] Almada proceeds to explain why he disagrees with Hanning's initial solution. Although his first approach was based on the analysis and deconstruction of geometrical tracings,⁶¹ in this manuscript Almada did not arrive at a clear alternative solution, and ultimately crossed out this section of the text, erasing the geometrical explanation and moving on to several pages dedicated to a more theoretical discourse. Almada keeps mentioning the "place of the right angle" (an expression he always keeps in quotation marks throughout the text), but he continues with a different approach: on the thirteenth page of the document, there is another crossed-out sentence: "In the name of art, modulator had a solution: the multi-millenary knowledge of the nine-ten relation."⁶² In order to reiterate his own solution as "the most universally lived", he adds: "with the knowledge of the nine-ten relation we would have several 'places of the right angle'".⁶³ Almada tries to assert the universality of his own proposition stating that it is wider than this specific problem: it is a "solution" for "several" other possible problems.

[30] I believe Almada's bold statement derives from the path he had been developing before he knew about *Le Modulor* or the "place of the right angle", using geometry as a tool for

⁶¹ Apparently ignoring the aforementioned several variations and developments in *Le Modulor*, pages 37 to 43.

⁶² The original reads "Em nome de arte, módulo tinha solução: o conhecimento multimilenário da relação nove-dez."

⁶³ The original reads: "a mais universalmente vivida" and "Com o conhecimento da relação nove-dez teríamos vários 'lugares do angulo recto'".

understanding artworks and, simultaneously, as a vocabulary for his theoretical propositions. He does develop intricate geometrical tracings with progressively deeper implications in his own art practice, but he parts from *Le Modulor's* initial quest and practical applications, engaging in a more theoretical approach to the Canon, as the manuscript testifies. The hand-written text becomes progressively disconnected, with several revisions and crossed-out sections. The last page of the manuscript is a kind of epilogue, initially written in graphite, then erased, then written in ballpoint pen, and then reworked in graphite with cross-outs and alterations:

~~I pay my homage to the architect Le Corbusier for his modulor that serves us as a pretext for this account [...]~~ Not even wrong could we find someone who allowed us to communicate knowledge of which all we were doing was resurrecting it from the millenia.

In this speculation that began in 1926 [...] to this day, I have never yet found anyone who knew what these words meant: perfect number. They were all [...] attached to the golden number. They weren't even wrong.⁶⁴

Almada pays homage to Le Corbusier for being the "pretext" for the ideas he presents in this "account". By "pretext" we can read 'motivation', or 'trigger', in the sense that Almada's reading of *Le Modulor* compelled him to revise some of his geometrical and conceptual propositions and stimulated a critical appraisal, which he complemented with his own ideas. Almada communicates "a knowledge" that was immanent and that he "resurrected from the millenia", and he communicates it to someone who wasn't wrong (Le Corbusier), but whose ideas were, he believes, insufficiently informed. According to Almada, though he had "adhered to the golden number", Le Corbusier was not aware of the meaning of the "perfect number":

[...] the knowledge anterior to mathematics is not only prior to science but it is also prior to art. This knowledge has its own name, at least since Plato and Aristotle: Perfect Number. The place of the perfect number in knowledge is:

Immanence = number

The capturing of immanence = perfect number

Perfection = plenitude.⁶⁵

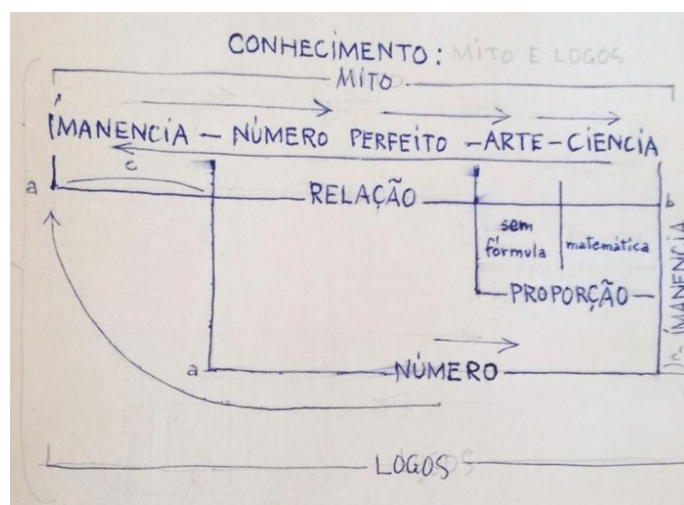
[31] Almada tries to show that Le Corbusier's ideas are not sufficiently contextualized theoretically: they lack particular notions of what comes before and after in the construction of knowledge. The golden number (approximately 1,618) is but one of the expressions of the Canon,

⁶⁴ The original reads: "~~Presto a minha homenagem ao arquitecto Le Corbusier pelo seu módulo que nos serve de pretexto para este relato [...]~~ Nem errados encontrámos quem nos permitisse a comunicação de conhecimento do qual não fazíamos senão ressuscitá-lo dos milénios. [...] Nesta especulação começada em 1926 [...] nunca encontrei até hoje ninguém ao par do que significavam estas palavras: número perfeito. Todos eram [...] aderidos a número d'oiro. Nem errados sequer."

⁶⁵ The original reads: "o conhecimento anterior a matemática, antecede não só ciência como também antecede arte. Este conhecimento tem nome próprio, pelo menos desde Platão e Aristóteles: Número Perfeito. A localização do número perfeito no conhecimento é: / Imanência = número / captação da imanência = número perfeito / Perfeição = plenitude".

but the perfect number (that Almada states Le Corbusier was not aware of) is anterior to the Canon. Almada associates the abstract notion of "number" with "immanence", and the notion of "perfect number" with the "capturing of immanence". As a reader of ancient literature and studies on classical antiquity, Almada's proposition echoes Plato's Theory of Forms: non-material ideas, forms, perfect and immutable, precede any imperfect materialization of physical objects, where forms are manifested *in immanence*.⁶⁶ In light of this context, Almada's perfect number is not actually a number at all, it is a concept within the framework of the construction of knowledge.

[32] Almada's multiple edits in the last pages of his manuscript "Arte é anterior de ciencia" (ANSA-L-261) lead me to believe that they resulted in yet another document, found in Almada's estate in March 2023 (ANSA-C-141),⁶⁷ which illustrates the previous statements about the "perfect number". In this document, technical analyses of geometrical tracings for Le Corbusier's problem are abandoned and the content of the text is mainly theoretical. Le Corbusier is once more referred to as a "pretext" for Almada's communication of his own considerations on concepts such as anteriority, immanence, or knowledge. The last page of this document (Fig. 10) seems to be a development of the previous attempt to systematize his thoughts on how the construction of knowledge can be organized. Here, arrows indicate the layering, or sequence of: "immanence – perfect number – art – science".



10 José de Almada Negreiros, scheme in manuscript "A relação nove-dez ou as figuras regulares" (p. 24), 1951. CEDANSA – NOVA FCSH, Lisbon, ANSA-C-141 (© Estate of José de Almada Negreiros)

⁶⁶ Eric D. Pearl, "The Presence of the Paradigm: Immanence and Transcendence in Plato's Theory of Forms", in: *The Review of Metaphysics* 53 (1999), no. 2, 339-362.

⁶⁷ Almada Negreiros, "Índice", annotated drawing, undated. CEDANSA – NOVA FCSH, Lisbon, ANSA-A-797 (© Estate of José de Almada Negreiros); <https://modernismo.pt/index.php/arquivo-almada-negreiros/details/33/2043>.

In other works by Almada (such as ANSA-A-797), this scheme develops into different versions, with variations on the visual organization of these concepts. The various versions have not been the object of a comparative study yet, but they help to understand how Almada's critical reception of Le Corbusier's work took on a very different route from his initial reading of *Le Modulor*.

[33] In 1965 Almada held a conference at the University of Coimbra with the title "Arte, a dianteira" (which could be translated as "Art, Ahead"). The text for this conference is divided into four parts,⁶⁸ the last of which holds the subtitle "*Tekné*".⁶⁹ In the conference text, Almada's argument is that "science cannot produce arts",⁷⁰ but "art [...] may or may not produce science".⁷¹ This is in line with the sequence presented in ANSA-L-261 and ANSA-C-141, in which art precedes science: this ordering allows for science to be a consequence of art, but not vice versa.

[34] But not only parts of the final section of the 1965 lecture seem to have been adapted from ideas present in ANSA-L-261; in the same year, Almada published *Orpheu 1915–1965*, where, once more, sections of the document appear, somewhat reshaped, and where we can read the statement "Art is antecedence of science".⁷² Almada's notion that art is prior, previous, or anterior to science, helps to understand the text in ANSA-L-261 and his contradiction of Le Corbusier's idea that architecture combines both art and science. In this document, written in a somewhat cryptic literary style that I have tried to respect in the translation,⁷³ Almada explains how:

[...] there is anteriority in art knowledge over science knowledge, much like geometry is anterior to arithmetics [...]. And if the intent is architecture being where art and science are combined, they don't come together: the anteriorities in each knowledge cannot have posteriority in a different knowledge.

[...]

⁶⁸ Published for the first time in José de Almada Negreiros, *Manifestos e Conferências*, Lisbon 2001, 320-323.

⁶⁹ A Greek term for the philosophical concept that refers to the creation, the making of art, craft or technique. According to Almada: "Greek word that simultaneously designates Art and Science" (in the original: "Palavra grega designando ao mesmo tempo Arte e Ciência"), Almada Negreiros (2001), 321.

⁷⁰ In the original: "Ciência não pode produzir artes", Almada Negreiros (2001), 321.

⁷¹ In the original: "Arte [...] pode ou não fazer Ciência." Almada Negreiros (2001), 321.

⁷² The original reads "Arte é antecedência de ciência", Almada Negreiros (1965), 23.

⁷³ The document is annotated by Almada himself, with small alterations to the text. I have opted to quote and translate the text considering these changes. The original reads: "[...] há anterioridade do conhecimento arte a conhecimento ciência, como geometria é anterior a aritmética [...]. E se se pretende ser arquitectura onde se junte arte e ciência, estas não se juntam: as anterioridades em cada conhecimento não podem ter posterioridade noutro conhecimento. [...] Se modular ensaia 'uma medida harmónica à escala humana, aplicável universalmente à arquitectura e à mecânica', quanto a arquitectura não poderá servir-se da secção d'ouro, pois é matemática; quanto a mecânica nunca escapará à escala humana. Poderá servir-se de matemática, mas como medida harmónica, nunca! Harmonia só a do todo, que arte conhece e ciência persegue. E esta há-de ir revestindo com demonstração até o cobrir, o todo em arte vivido."

If the modulator tries out "a harmonious measure to the human scale, universally applicable to architecture and mechanics" – regarding architecture it cannot use the golden ratio, as it is mathematics; regarding mechanics it will never escape the human scale. It can use mathematics, but never as a harmonious measure!

The only harmony is that of the whole, that art knows and science pursues. And this [science] will continuously layer with demonstrations until it covers it, the fullness that is lived through art.

"The anteriorities in each knowledge" (the order in which the construction of knowledge is layered), "cannot have posteriority in a different knowledge" (does not allow for concepts that precede other concepts to appear as a result of the latter). Almada critiques the application of a harmonious measure (the golden ratio) in architecture or art, because it is mathematical, and science cannot produce something that is anterior to it (art). According to Almada, mathematics can be of use, but not as a harmonious measure, because harmony is within art's sphere of knowledge. In pursuing harmony, in trying to demonstrate it, science will create an opaque layer of proof that obscures a wholeness that can only be reached through art. Almada's disagreement with the subtitle of *Le Modulor, A Harmonious Measure to the Human Scale Universally Applicable to Architecture and Mechanics*, has to do with Le Corbusier's attempt to define applications for the canon, relating areas of knowledge in a way Almada finds epistemologically wrong.

[35] For decades, Almada wrote hundreds of drafts of texts and essays on art theory, relating the importance of geometry to philosophical concepts. A comprehensive study of the manuscripts is still being carried out, but because this is one of the few occasions on which Le Corbusier is mentioned, it is worth transcribing another part of this seventeen-page document to further clarify his critique of Le Corbusier's conceptual proposition.

The architect can also be a mathematician, but as an architect, mathematics also comes after architecture: never will the mathematician find proportion for his art as an architect.

Art is outside mathematics, consciously, not just outside but, and most of all, anterior to it: art precedes science and, of course, even science that preceded it.

It was left unsaid: the knowledge of the regular figures anterior to geometry precedes science as much as it precedes art. [...]

Before art there is no proportion, only relation. Before relation is grasped [...] there is immanent relation. Before the proportion of science, there is the proportion of art, non formulaic, not mathematical.

The purpose of science is the relation in immanence, not the relation grasped for art and science.⁷⁴

⁷⁴ The original (ANSA-L-261) reads: "O arquiteto será também matemático, mas, em arquiteto, também a matemática é depois da arquitetura: nunca o matemático encontrará proporção para a sua arte de arquiteto. / Está arte fora de matemática, conscientemente, não só fora como, e sobretudo, anterior a ela: arte antecede ciência e, claro, até ciência que a antecedeu. / Ficava por dizer: o conhecimento das figuras regulares anterior a geometria, tanto antecede ciência como antecede arte. À ciência, antecede-a pela arte.

Most of this section reiterates the previous arguments, however, Almada's distinction between proportion and relation is of interest, as it further illustrates his notion of anteriority. He identifies proportion as a measurable relation, whereas a relation can be perceived even without being measured. Relation is therefore "anterior" to proportion: even before it is perceived, a relation can exist, waiting to be "captured". I argue that this is what Almada means by "immanent relation". Proportion in art and proportion in science are different materializations of potential relations, the first preceding the latter in that it is less constructed ("non formulaic"), closer to the originally perceivable relation. In Figure 10, the term "relation" appears under the sequence "immanence – perfect number – art – science", and on top of "relation" there is an arrow in the reverse direction of the sequence, from "science" to "immanence", which is in line with the text: "The purpose of science is the relation in immanence". The relation in immanence is prior to any attempt to materialize ("capture") that which is immanent. Relation itself can be "captured" by both art and science, but through different, independent means. Almada's illustration is helpful: we can perceive the notion of "regular figures"⁷⁵ even before geometry, and only after we have perceived them can we attempt to define them ("capture" them) through art or science.

[36] This is why the term Almada coined for his own definition of the canon – Relation 9/10 – is consistent with his theoretical arguments, and why he argues that it is more universal ("the most universally lived") than any other. The Relation 9/10 does more than just materialize a proportion, it seeks to gather multiple expressions of "immanent relation": Figures 5 and 6 show two different kinds of proportion stemming from the same relation (geometric and algebraic, respectively), but Almada found (or "captured") others, such as the materialization of the Relation 9/10 in the diameter of a circumference.⁷⁶ From art (drawing geometrical tracings) he tries to arrive at science (mathematical propositions), a procedure coherent with his construction of knowledge, but which is reversed in Le Corbusier's approach, who tries to apply a proportion ("captured" through science) to art: "a measure based on mathematics".⁷⁷ If the objective of science is independent from art and comes after the objective of art, then Almada's overall critical reception of the Modulor becomes clear and is summarized in the statement "never will the mathematician find proportion for his art as an architect". The architect, in creating his art, must not seek his vocabulary in proportion (which is mathematical), because the purpose of science does not precede the purpose of art.

/ Antes de arte não há proporção, senão relação. Antes de relação captada [...] há relação imanente. Antes de proporção de ciência é a proporção de arte, sem fórmula, não matemática. / O fim de ciência é a relação na imanência, não a relação captada para arte e ciência."

⁷⁵ By "regular figures", Almada is referring to geometrical figures, specifically regular polygons.

⁷⁶ Almada claims that the diameter equals twice the 9th part plus one 10th part of a circumference, obtaining a surprisingly close approximation: Palmeirim and Freitas (2015).

⁷⁷ Le Corbusier (1980), 60.

Conclusions

[37] With the documents presented here, it is now possible to establish a new relationship between the two authors Le Corbusier and Almada, which shows parallel methodologies as well as a deconstructive reading of Corbusier's work by Almada. Following similar research paths, they both attempt to define conceptual frameworks for their methodologies, propose a geometrical system that articulates theory and practice, and present a chronological review of their research in order to leave a premeditated legacy.

[38] Almada's critical reception of *Le Modulor* in 1952 provides us with new tools to understand how his artistic *praxis* was reshaped from then on. It fueled his laborious dedication to hundreds of notebooks filled with drawings and texts, which we can now date, with great probability, to the years from 1952 onwards, as the vocabulary he used here is similar to that which he used in the organization of knowledge schemes. The author continued to develop geometrical tracings and focus on geometrical abstractionism in his visual work, but his reading of *Le Modulor* fostered a more conceptual line of inquiry, looking for an epistemological framework for the relation between art and science. In the last ten years of his life, this is also reflected in the forms of interview,⁷⁸ conference,⁷⁹ publication,⁸⁰ or in his last commissioned artwork in which he had complete artistic freedom,⁸¹ all of which can be interpreted with the new information that these documents reveal.

[39] His critical reception of Le Corbusier casts a new light on the relevance of the term used to designate Almada's materialization of a universal canon – Relation – as it consciously diverges from the European discussions on Proportion. Understanding his alternative, autonomous approach helps to move away from traditional notions of "influence" and center-periphery dynamics, and to re-evaluate this author, who is still relatively unknown in contemporary international scholarship.

⁷⁸ Almada Negreiros and Valdemar (2015), originally published in 1960.

⁷⁹ Almada Negreiros (2001), 320-323, conference originally held in 1965.

⁸⁰ Almada Negreiros (1965).

⁸¹ The 1968 mural *Começar* (Beginning), a 12.87 × 2.31 m incised and painted drawing on limestone at the Calouste Gulbenkian Foundation, Lisbon.

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About the Author

Simão Palmeirim is a researcher at IELT (NOVA-FCSH), the Institute for the Study of Literature and Tradition, Faculty of Social and Human Sciences, of NOVA University Lisbon, where he explores the relations between theory and artistic practice in geometrical abstractionism in Portugal. His most recent research focuses on the work of Almada Negreiros, a modernist author and artist on which he has curated two exhibitions, at the Batalha Monastery and Lisbon's National Museum of Ancient Art (2020–2021).

After completing a BFA Painting at the Faculty of Fine Arts of the University of Lisbon (FBAUL; 2007), an MFA at Central Saint Martins, London (2009), and a PhD in Art Sciences at FBAUL (2016), he was a lecturer at the Faculty of Arts and Humanities of the University of Coimbra (2022–23/2023–24), and has been responsible for several scientific production and dissemination actions (conferences, editorial coordination, digital contents etc.).

Palmeirim works as an independent curator and is currently a member of the Scientific Committee at CEDANSA (Almada Negreiros – Sarah Affonso Research and Documentation Center).

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