

# ON ARCHITECTURE AS PROJECT-ORIENTED METHOD: TOJAL, MOREIRA AND ROXO A CASE STUDY

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## ABSTRACT

Focussing on the statements of a group of architects from Lisbon's School of Fine Arts, founders of the *Multiplano* atelier, this lecture offers an insight into the development of a project-oriented-culture within those circles. Their quest, which involved abandoning all dogmatic form, standing against geniality and individual inspiration, contributed to the implementation of processes, imagistic ideologies and activity relating to what by the late 50s, quite silently given its inherent socialist connotations, was being inaugurated in Portugal under the aegis of the term Design.

This study uses historiographical and applied research methodology, based on the discovery of Multiplano's archives and a subsequent inventory of their work and collaborators. The discovery of a particular document by Carlos Roxo brought to the discussion specific concepts like *Useful*, *Scientific Aesthetic*, *Architecture as Visual Art* and the *Organic Materialist Method*.

Stimulating interaction between art, science, emotion, technology and the common Man; claiming the architect to be an artist, whose metier is a form of arts-based research (which by means of Scientific Aesthetics instigates debate on architecture's syntax, semantics, method and utility), our protagonists provide an ideological and professional testimony on the growing awareness of a science of design in Portugal.

**Keywords:** Portuguese Design History; Synthesis of the Arts; Project Methodology; Material Culture; Design Studies.

## INTRODUCTION

Within the context of the history of material culture, as well as the theory of design, the present lecture is part of a PhD study, which aims primarily to provide new data on Portuguese Design History.

The object of the study is the *Multiplano* atelier, established in Lisbon around 1972 by the architects Carlos Tojal (b.1929), Manuel Moreira (b.1933) and Carlos Roxo (b.1935), who between 1961 and 1974, jointly developed a vast and coherent project-oriented and ideological body of products. The study comprises an original survey, since no more than brief references in general studies are found about their work, along with a few personal testimonies from *Arquitectura* and *Binário* magazines.

Framing the problem of Design in Portugal from its process point of view, rather than from its object, and unveiling new data on it, this article is structured around two main nuclei. The first, on the place and the mode, gives an account of the Portuguese conceptual context regarding projectual culture, in the transition from the old autocratic regime to the ignitable disposition to act that characterises the post-war period. The second refers to *Multiplano*'s protagonists, and briefly discusses their contributions to project-oriented culture. This second section includes a particular reference to Carlos Roxo's dissertation for his architecture diploma (1963), which testifies on the disruption brought about by the reorganisation that, in 1957, signified the end of the *Beaux-Arts* Parisian system in Portugal's Fine Arts Schools, and provides evidence on the new socio-economic context which would lead to the momentum generated by the 1974 revolution. It is a militant stance for a work process that is based on material and dialectical selections and principles; it addresses life and, considering the need for cooperative action, is not underpinned by drawing. It is a written testimony of what the group's work became known for: a merger between what we now call arts-based research and a contemporary approach to design (both considered globalising disciplines).

The present article's disregard for the boundaries between architecture and design conveys the scope of "Synthesis of the Arts" that characterises the Portuguese context in that period. It expounds the group's approach which, by opposing functionalism *stricto sensu*, earned Carlos Tojal, Manual Moreira and Carlos Roxo the "Three Wonders" epithet.

### 1.1 A MORAL IDEA OF NATION

Between 1933 and the end of World War II a strong autocracy<sup>1</sup> ensured Portugal's isolation from the post-war European democratic reconstruction and the widespread debate on Design's genetic social utopias. Perceived as being rooted in progressive and internationalist convictions, Design was to be restrained, as it opposed the *moral entity*<sup>2</sup> according to which the nation was to be understood.

The State's proclaimed national identity consisted of a mythicised purity and unblemished vernacular, a view reinforced in the 40s by the *Portuguese World Exhibition* (1940) iconographic program. Suppressing the architects who championed modern concepts<sup>3</sup>, which had only started to bud in Portugal by the 30s, the official theories embodied formalistic stylisations of regional influences and employed eclectic and historicist language. And so

Portuguese cultural heritage was not to be studied from the scientific, aesthetic or functional point of view.

This position was challenged in the *1<sup>st</sup> National Congress of Architecture* (1948). Reinforcing their legitimacy as a social class, the delegates sought emancipation from the official models, declaring also the urgent need to reform the architecture teaching of the time. Among its leading proponents were Porfirio Pardal Monteiro (1897-1957) and Carlos Ramos (1897-1969), both members of the first generation of Portuguese modernist architects and both practitioners of “Synthesis of the Arts”. It is precisely next to these men that we come to observe the path of the Tojal architects. Raúl Tojal (1899-1969), herald of Art Deco in Portugal and a frequenter of Carlos Ramos’ Atelier<sup>4</sup>; Diamantino Tojal (1898-1958), who was Porfirio Pardal Monteiro’s master builder and the father of Carlos Tojal.

Carlos Tojal was the man who brought Manuel Moreira and Carlos Roxo together in his studio, establishing a society which, through their conceptual, formal and visual audacity, asserted the social role of the architect as that of an artist, questioning functionalism *stricto sensu* and the *traditional*<sup>5</sup> way of working. Alongside Conceição Silva’s Atelier, they were responsible for the many and most sensorial spaces of commercial representativeness in Lisbon, underlining the primacy of services, functionalities and experiences over simple functions; of technical and artistic analysis over dogma.

## 1.2 ON THE PLACE OF DESIGN

1948, besides being a milestone for the official emancipation of architects from the State’s doctrines, was also a landmark as regards the permeability of some of the state’s agents to external political developments, for it marks the year when Portugal signed the founding treaty of the Organisation for European Economic Co-operation (OEEC)<sup>6</sup>.

However, only by the late 60s with the Intersperse Plan (1965-1967) and the Third Fomentation Plan (1968-73) was the need to abandon an inward-orientated chart of growth understood and clearly fought for.

The confrontation between national industry and its external counterparts amplified the sense of inadequacy, giving rise to the long-awaited opportunity for the arts to join structurally with science and industry in an effort to develop the country and its society. Agents committed to such a task within ESBAL and ESBAP<sup>7</sup> (the only two institutions allowed to teach Architecture, Painting and Sculpture in Portugal) would nevertheless continue to be silenced or kept apart from their staff. In 1957 a great reorganisation took place in both schools, allowing their courses to be considered as higher education courses and closer to the University. However only with the restructuring of 1974 was Design allowed in. And so Design took another path.

As part of the effort to improve the industrial product, in 1959, supported by the Ministry of Economy and the State Department of Industry, the *National Institute of Industrial Research* (INII) was established. Within it, for the investigation of artistic and technical issues, the architect António Teixeira Guerra (b. 1929) developed the *Art and Industrial Architecture Nucleus* (1960-1971). Later on, as director of the Nucleus, the sculptress and glass designer Maria Helena Matos (b. 1924)<sup>8</sup> organised the *1<sup>st</sup> Fortnight of Industrial Aesthetics* (1965). However, under this title of *Industrial Aesthetics*, she managed to organise a series of conferences on “Industrial Design” lectured by several European experts. This event, together with the complementary *International Exhibition of Industrial Design* and

its homonymous catalogue, established a milestone in Portuguese design history, as for the first time the English term design was integrated in the lexicon of the official discourse. It was also due to the INII that the 1<sup>st</sup> (1971) and 2<sup>nd</sup> (1973) *Portuguese Design Exhibitions* took place, the latter with the participation of IADE<sup>9</sup>.<sup>10</sup>

### 1.3 ON ARCHITECTURE AS PROJECT-ORIENTED METHOD, TOWARDS A SCIENCE OF DESIGN<sup>11</sup> WITHIN THE LISBON CIRCLE

At the Lisbon School of Fine Arts the 1957 reform (due among other things to the 1<sup>st</sup> *National Congress of Architecture*) marks the counterflow in relation to the *Beaux Arts* formula. The sectarian concept of an ideal and stylistic formalism is questioned; the notion of “art for art’s sake” and the exaltation of the individual’s author genius are disputed. Life begins to be considered, and so do the techniques and technologies in a dialectical approach to the project, explored in multidisciplinary working groups.

Gonçalo Moniz, who has studied modern architecture teaching in Portugal between 1931 and 1969, observes that in Lisbon, until the 1957 reform, drawing had always been seen as an exercise for the representation of the Classical orders<sup>12</sup>, still limiting History to the periods before the Renaissance<sup>13</sup>. The Fine Arts School of Oporto would know a different destiny, since from 1940 the architect Carlos Ramos was sowing the seed of modernity, also translating for his students, circa 1940 or after 1950, Gropius’ “Blueprint for an Architect’s Training”<sup>14</sup>. Thus he began there what he had been prevented from starting at the Lisbon School of Fine Arts in 1933, when his application for a teaching position was rejected in favour of the architect Cristino da Silva (1896-1976).

In the Architecture course at the now Superior Lisbon School of Fine Arts, the reform was only fully implemented from 1957 onwards by the anti-dogmatic actions of Frederico George (1915-1994). Painter, pedagogue, architect, and scholar of ancestral techniques and technologies, Frederico George is the man who from the 40s, at the António Arroio School of Decorative Arts in Lisbon, led the first experience in design education in Portugal<sup>15</sup>. The same man had in 1949 seen himself banned from public teaching for political reasons, being readmitted in 1955<sup>16</sup>.

Manuel Moreira and Carlos Roxo’s teacher, George is the one who stands out in the Lisbon circle, questioning, among other things, the role of drawing in the architectural project; the one before whom Roxo would defend his dissertation.

«The artist, whether sculptor or painter, lacks something if he has not practised architecture».[...] with the proper courtesy I claim the right to say: «The artist lacks something, who being an architect has not practised painting or sculpture».<sup>17</sup>

Frederico George says then that the utilitarianism battle in architecture is won, at least in the majority of the *world’s countries*, but that the heroes of the modern movement themselves knew that functionalism in itself was not enough. So, Frederico George calls the architect an *artista plástico (visual artist)* and pronounces another great task for them to accomplish — *the integration of emotional value into the material functions of architecture* <sup>18</sup>.

It is to the visual arts sense that Frederico George appeals when looking for the *aesthetical ordination of volumes*; searching, in the choice of textures or colours, for *harmonies or disharmonies capable of emoting*<sup>19</sup>. Frederico

George evokes the words of Isamu Noguchi regarding the work of architect Harris Armstrong for the American Stove Company, in order to support his argument. Among other images, George uses Moholy Nagy's exercises from the Institute of Design in Chicago for the study of materials (structure, texture, aspect), of light, of space; or the studies of form at Ulm's Hochschule für Gestaltung to illustrate his *Considerations on the Teaching of Architecture* ([1957] 1964), a dissertation with major implications for the renewal of project-based teaching in Portugal<sup>20</sup>.

Frederico George strove to develop a project-oriented method as an alternative to the former *Beaux-Arts* system. Rooted in experimentalism, workshop and multidisciplinary group research, George sought to articulate between: history and modernity; arts and crafts; reason and emotion; useful and symbolic; visual perception, its foundations and scientific thought; the techniques, the technologies and the social and human sciences; analysis and synthesis. So, with the above dissertation, Frederico George deposes the prevailing academicism by approximating art to science and emotion, to technology and to the common Man.

What matters is not to lose sight of the benefit which Bauhaus has brought to us, to look for its integration in a country like Portugal [...]. One of the principles supported by Bauhaus — the position of architecture no longer as the «high art», the «mother of all arts», but simply as an activity which, belonging to man, is directed towards him, as the product of design [...].<sup>21</sup>

## 2.1 CARLOS TOJAL, MANUEL MOREIRA AND CARLOS ROXO, QUESTIONNING THE CONTEMPORARY WORLD: A MANIFESTO IN 1968

The 101<sup>st</sup> issue of *Arquitectura* magazine depicts on its cover a work by Tojal, Moreira and Roxo (Figure 1); inside features a perspective of their work. Carlos Duarte (ed.) justifies his option: «immodesty»; a program of adequacy, vitality and signification, the antipode of *simple mechanical functions*, which surpassing the structural level of data exists at the semiological level; the unmistakably *urban* character, diverse from the *populist and ruralist aesthetics (and ethics)* which cause such a delay in the evolution of modern architecture in Portugal and the distinction against the *northernmost imported brutalism*<sup>22</sup>.



Figure 1 – Carlos Tojal, Manuel Moreira and Carlos Roxo (architects), Lagoa Henriques (sculptor) and Rogério Ribeiro (painter). “Fonsecas & Burnay” bank filial, Oporto, 1965/1967. Photos: (1968) *Arquitectura*, 101.

The problem is one of Integration<sup>23</sup>; the requirement of promotion<sup>24</sup>; of institutional representativeness<sup>25</sup>. Dialectically operating over models, Tojal, Moreira and Roxo involved from the *Preparation Phase*, the sculptor Lagoa Henriques (1923-2009) and the painter Rogério Ribeiro (1930-2008) in the project — the final synthesis is a material manifesto of their perception of the scope of architecture. It also follows the principles advocated by Frederico George.

Tojal, Moreira and Roxo favour the social environment, and consequently life and *the man of human condition*, the common man, described as he “[...] who defines the architect’s intervention terms as a professional and as a citizen.”<sup>26</sup> He is also the protagonist of the reality to be considered by all aesthetical language. Thus, rhythm is that which, by its kinetic expression, best represents the sense of tension and vertigo that characterises the reality we live in.

Rhythm and Contradiction are “[...] the fundamental terms of all aesthetical language which, today as yesterday, considers reality and within it the common man, as protagonists”<sup>27</sup>. A contradiction of opposites — the basis of all aesthetic phenomena.<sup>28</sup>

The declarations they signed bring to mind the Realistic Manifesto by Gabo and Pevsner of 1920 (governed by the laws of life — space and time, kinetic rhythm — real time’s perceptual means, entities from which art shall be built). It may be an ideological reference to be considered, however, after 48 years, they integrated and surpassed it in a hedonistic sense — a common feature of all their subsequent work.

They reject the *machine’s divinisation*, in the strict sense, and the synonymous conception of man (which does not mean the negation of contemporary technological reality). Once their conceptualisation is applied to the social environment, they classify architectural language as a *symbolic way of communication*. Carlos Roxo even refutes *useful antinomy* — a feature of classical German philosophy — a problem from the history of aesthetics, which asserts that which is of use cannot be beautiful; an antinomy already demystified, he states, by modern architecture.

Given that the utilitarian purpose of architecture is for people to live as pleasantly as possible, and conscious of the contemporary conceptual currents, this is precisely the point in which Roxo situates a convergence of *métier* between architects, painters, sculptures and musicians. Working the space to make it alive, these complementary languages and techniques flow into, by virtue of reality itself, this same problematic in a common project<sup>29</sup>.

We learn about different stages of project-oriented culture from the collaborative work between these three authors from the 60s to 1974: from the professional superiority of the renowned architect, to the assumption that architecture is an objective dialectical group discipline always within the “Synthesis of the Arts” concept; to a structural collaboration with painters and sculptors and to the incorporation of graphic and product designers in a team. The discovery of *Multiplano’s* archives in the course of this investigation (December 2013) enabled an inventory of the extent of their work and a list of a large number of collaborators (Figure 2) to be compiled.

Throughout the team’s existence their in-depth exploration of the contemporary world, the scope of architecture, and the role of the architect as an artist in society is vivid, expressing itself as a hallmark in all the group’s work.



Figure 2 – Carlos Tojal, Manuel Moreira and Carlos Roxo (architects), Jorge Pinheiro (painter). “Castilho 50” Building (working model of the hall, detail), Lisbon, 1965/74. Photo: Sandra Antunes.

Significant for its activism, among the written documents we are aware of to date in this quest towards Projectual Culture that in Portugal led to the emergence of design, is the dissertation presented by Carlos Roxo for his architecture diploma at ESBAL. This document is presented individually, since it has as yet been impossible to locate the theses of Carlos Tojal and Manuel Moreira.

Born from the division of work, the architect’s place in class society is *broad, liberal and urgent*<sup>30</sup>. Submitted in 1963, Roxo’s dissertation is a testimony on this emergent moment. Calling for an artistic and technological experimentation of materials; grounded in reality, and scientifically and socially informed, Roxo defies the masterdom of idealistic drawing. From this he calls for a project-oriented culture, performed by an Organic Materialistic professional; thereby giving way to the *Science of Design*.

## 2.2 TOWARDS A METHODOLOGY OF ARCHITECTURE AND THOUGHTS ON SCIENTIFIC BEAUTY: CARLOS ROXO — A THESIS IN 1963

Towards a *Science of Design* highlights, in the way Carlos Roxo describes the architect’s social commitment, the decentring of unexplained expression from the self and the search for a perceived language, which validates its action by anticipating one’s reaction. From this principle emerges the need, as well as the occasion, for the study of what Roxo calls the scientific beauty, accomplished by objective aesthetical study; a socially and historically instructed science that informs the artist’s *utilitarian activity* — functional, aesthetical, ontological and ludic.

Introducing Roxo’s dissertation, and projecting it simultaneously in the future, are two basic ideas: that of architecture as a visual project, illustrated by a Gropius quotation; and the conviction that natural organics is explained in a permanent action/reaction dynamic, citing Engels<sup>31</sup>. To the notion that in addition to technical knowledge there is a *grammar of design, a language of vision*, derived from objective knowledge of optical facts, which relates to other senses and psychological experiences that the designer must learn<sup>32</sup>, Carlos Roxo adds the importance of the social class determinant cause and the individual experiences of each human being. During this

time of censorship and repression, the dissertation was a combative manifesto, firmly aware of the means, scope and purpose of the architect profession.

### ***On architecture as visual art:***

The project maker must learn to see; must know the optical illusions effect, the psychological influences of forms, colours and textures, the contrast effects, the direction, the tension and the rest, and must learn to capture human scale significance. “Scope of Total Architecture” — Walter Gropius.<sup>33</sup>

Defining architecture as a “Visual Art” and, *born from work, an eminently utilitarian activity*<sup>34</sup>, Carlos Roxo professes a statement of intent. On one hand, a new system of values is brought into the artistic field, spreading wide and democratising its domains into the sphere of daily life; on the other hand he widens the scope of the term *utilitarian*, enriching it with data from the artistic research universe, announcing his vision of a broader dimension in project-oriented concepts.

Sustained as a “Visual Art”, the project-oriented object comes to be dialectical and phenomenologically conceived and brought to fruition. An experience grounded in group workshop interaction with the things themselves, not idealised, but socially, historically and culturally informed. Alongside technical and technological preparation, it is now important to study the functionality of the visual / architectural work, its forces and tensions — and it will not be classical drawing that will enable it, since this is parted from life as well as from the dialectical experience of trial and error — thus a new method and language are required.

### ***On architecture as visual art, on scientific aesthetic and on the resolution of the useful antinomy:***

The purpose of art is that of all social activities — to contribute to the happiness and progress of mankind. [...] Otherwise it has no utility and meaning, and it disappears.<sup>35</sup>

Carlos Roxo understands architecture as being first of all an art; and an useful art as one which is socially committed, that is, with social significance and utility<sup>36</sup>. Nevertheless, it is not in the strictly utilitarian sense that Roxo attributes the term *useful*.

As a matter of fact, architecture’s functional utility could never be seen as an exclusive aspect of reason, given that in the *fight for a useful Beauty, real, adapted to the function which is assigned to it*<sup>37</sup>, there are other opposed dialectical aspects acting, such as: *non reason, impulse, fantasy, imagination*. This circumstance emerges precisely from its condition of being an art — that is, a synthetic resolution of contradictions<sup>38</sup>.

Conceived in such a way, the artistic and useful domains do not oppose themselves, given that: “[...] Art looks for The Useful to vitalise itself, to exist, just as The Useful requires Art to dignify itself, to be actually Useful. Because Useful and Function are two factors with one only purpose — socialisation of the artwork.”<sup>39</sup>.

To serve its purpose, it is also necessary for architectural language to be free of dogma or conditioning relating to the imitation of the natural world, because it is creation itself that enables architecture to enter the arts field.<sup>40</sup>

This premise inspired Roxo's interest in the study of optical illusions, recognising distinct visual truths from those of the ideal aesthetic. He derives from this research, as from that of perception or from the psychology of vision, the potential to extend architecture's expression capability, and its Useful efficiency, above the limited formal resources available to the architectural discipline.

Principles like those listed by Fechner, Zöllner, Sokolov and Pavlov, among others, are to Roxo as inevitable as matter itself or any law of physics, because they enable architecture to act. This is because architecture is "Lyrical", it is artistic and not exclusively scientific or rational, neither in its language nor the operating level at which it performs, and for Roxo, "Deprived of its language, Art is nothing, because it doesn't act, because it is quiet."<sup>41</sup>

In this context one must refer the appreciation of rhythm, the visual form of the perception of movement/time; the conceptual form of communicating actions; the physiological form of inciting action. A hallmark of *Multiplano's* work.

As *action*, Art suggests thought; action that Roxo considers literally or in a figurative sense an "image". From this point of view architecture is still a symbolic art, not because it utilises symbols, but because *it reaches through the figurative image its integration in reality*<sup>42</sup>. An oneiric *aptitude or ability to evoke*, which is also used to broaden the expression of the limited formal resources of architecture's language, succeeding also *in overcoming the utilitarianism that determines it*<sup>43</sup>.

Roxo resolves *useful antinomy* then, in this dialectic of opposites, attributing efficient legitimacy to architecture in a visual sense, even when it is made into a spectacle.

We shall say, then, that the architect acts with Images, that he is a producer of Images. And if architecture is a spectacle, all of us feel and inhabit those Images in "space" or in volume, in colour or in light, in rhythm or in matter [...]. «To this exterior world, we still need to join the inner worlds, also invisible and also essential to the action: characters' feelings, thoughts» that live inside and outside of the work, and that in it unleash all human existence.<sup>44</sup>

Roxo names the merging of the interior and the exterior world *integration*, performed through the coherence of "Form" and "Content". And how shall an authentic *Integration* of architecture in Society, in Nature and in Man be achieved? Not by reproduction, but by perfect coherence of thought, action and register, acquired in the profound knowledge and love of the social environment<sup>45</sup>.

## On the Organic Materialist method

My method of work, "[...] let us call it Organic Materialist [...]" is of an experimental nature, because always, in each stage of the work, [...] it starts at the hypothesis [...] from verification to verification [...] until the induction of a final form [...].<sup>46</sup>

Carlos Roxo's method arises as a denunciation of the idealistic attitude of creation following an "impulse" or intuition; it is not a method that can exclude any other and any law concluded by it, shall never be absolute. It dialectically moves among Aesthetics, Art, Society and the individual. All its actions are a struggle of opposites in which reason and sentiment contradict each other, in each shape, until the selection of that which synthetically best reunites them.<sup>47</sup>

It's said to be Organic because of its permanent reference to the social man;

Materialistic for banishing all speculation, working over matter in order to make coherent a “Form” and a “Content” (not according to individualist psychology, but rather a psychology of class).

It is besides that a way of “Integration” in the environment, and environment signifies society in this context. Given that

[...] more that all the trees, all the hills or the whole sky that constitute a natural environment, the social environment is the environment of architecture. Being a prolongation of nature, Organic Architecture is not its apologia (surpassing, then, Frank Lloyd Wright’s concept).<sup>48</sup>

## CONCLUSIONS

To travel from drawing to design within the Portuguese context of an extended post World War II dictatorial conjuncture, is to embark with several men and women on their quest for social and artistic utopia. So this is not primarily a discussion about the object and boundaries of design, but rather the quest to implement methodologies that may question the design project, by promoting dialectical interaction between all the objective knowledge embedded in it: exact sciences, arts, technology, human and social knowledge, cooperation, freedom of expression and militancy in favour of social development and the common man’s welfare.

This is also a reason why this article does not make a clear distinction between architecture and design, for it is mainly the expanding of this attitude by working through problems that holds significance in this period of our history.

It isn’t until 1965 that we find the word design in the official discourse in Portugal; and not until around 1972 that we are able to read it in *Multipiano*’s advertising leaflets (architecture, engineering, design — appearing separately at that time). By the 70s we arrive at a specialisation of disciplines and by the 80s, with the 1974 momentum now passed, to a criticism of the growth of personal interpretation and stylisation by the previous generation.

By the 60s several experiments with scientific methodologies regarding architecture were taking place (quite late when compared to the external scene). Through its break with traditional teaching, the promotion of urban inquiries is considered to be one of the most radical methodologies put into practice.<sup>49</sup>

After the movement against revivalism, a period of plural expression of forms and meanings emerged. From the 60s to 1974 the three architects in question had a very brief period of coexistence. Emerging from a period when the theoretical support to practical work was very poor, in the context of a fragile architectural culture, a preoccupation with promoting public debate, on reporting critical reflection, on legitimising architecture’s class purpose and grounding it among the arts, strongly characterises their activity.

Conducting dialectical cooperative experimentation, our three protagonists’ work stands out for, among other things, not relying on drawing and exercising the value of artistic experimentation. Equally important was their audacity in overcoming functional objectification: stressing visual and lyric tensions; considering the value of multi-sensory signs in their integration of form and content — broadening the understanding of the architectural utilitarian purpose and placing the human being at the centre of the project, not only as a mechanical body, but in all his social dimensions.

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## Notes:

<sup>1</sup>  
Souto, M. Helena, *Design in Portugal (1960-1974): the actions, actors and repercussions of the Art, Industrial Architecture and Industrial Design Nuclei of the National Institute of Industrial Research (I.N.I.I.)*, 2016.

<sup>2</sup>  
Salazar, A. Oliveira, "Discurso aos Congressistas da União Nacional", 1951.

<sup>3</sup>  
Such as Carlos Ramos (1897-1969) — an architect whose teaching application for the Lisbon School of Fine Arts was rejected in 1933. The same who, during the 30s and 40s, firmly stood against the academic teaching of our fine arts schools. It was Ramos' hiring by Oporto's Fine Arts School in 1940 (becoming its director between 1952 and 1967) that started the renewal of architecture teaching in our country. Coutinho, Bárbara S., "Carlos Ramos (1897-1969): Obra, pensamento e acção. A procura do compromisso entre o Modernismo e a Tradição", 2011, p.7-8 and 330-336.

<sup>4</sup>  
Coutinho, Bárbara S., "Carlos Ramos (1897-1969): Obra, pensamento e acção. A procura do compromisso entre o Modernismo e a Tradição", 2011, p.56 and 332.

<sup>5</sup>  
Multiplano, "Multiplano", ca.1972.

<sup>6</sup>  
ROLLO, M. Fernanda, *Portugal e a Reconstrução Económica do Pós-Guerra. O Plano Marshall e a economia portuguesa dos anos 50*, 2007, p.187.

<sup>7</sup>  
Lisbon's and Oporto's Superior Fine Arts Schools.

<sup>8</sup>  
Maria Helena Matos studied sculpture at Lisbon School of Fine Arts (1956) after which she won a Fundação Calouste Gulbenkian's scholarship to experiment with and evaluate the possibilities of glass bas reliefs, which, along with a scholarship from INII, led her to glass design. In December 1959 Maria Helena Matos exhibited in Palácio Foz, Lisbon, the results of the above research, which she developed at Stephens Brothers School-Factory in Marinha Grande.

<sup>9</sup>  
A private art institute, founded in 1969 by the philosopher, essayist and professor António Quadros (1923-1993), which rapidly evolved from a school of decoration to a school of design. The abbreviation IADE, which initially stood for the Institute of Art and Decoration, came to mean the Institute of Art and Design. Souto, M. Helena, "Design em Portugal (1960-1974): uma dialéctica entre tradição, modernidade e utopia", 2013, p.7.

<sup>10</sup>  
SOUTO, M. Helena, "«Design» em Portugal 1980-1990 — Dispersão Pluralista", 1992 to Souto, M. Helena, "Design in Portugal (1960-1974): the actions, actors and repercussions

of the Art, Industrial Architecture and Industrial Design Nuclei of the National Institute of Industrial Research (I.N.I.I.)", 2016.

<sup>11</sup>  
An expression borrowed from Gropius (1947), alluding to the meaning of the term design as: broadly embracing the whole orbit of man-made visible surroundings, provided it is reached through objective findings rather than personal interpretation, "[...]for the process of designing a great building or a simple chair differs only in degree, not in principle." Walter Gropius, "Is There a Science of Design?", [1947]1962, p. 30. An expression that intends also to pay tribute to the relevance of Gropius' writings on architecture's modern teaching in Portugal; and to make implicit the globalizing way in which the cited authors understand design in the period under consideration, justifying architecture to be a branch of it.

<sup>12</sup>  
Moniz, Gonçalo E.O.C., "O Ensino Moderno da Arquitectura, A Reforma de 57 e as escolas de Belas-Artes em Portugal (1931-69)", 2011, p.387.

<sup>13</sup>  
Arch. Manuel Tainha in interview, *apud* Moniz, Gonçalo E.O.C., *op.cit.*, p. 390.

<sup>14</sup>  
Coutinho, Bárbara S., *op.cit.*, p.255; or Moniz, Gonçalo E.O.C., *op.cit.*, p. 225.

<sup>15</sup>  
SOUTO, M. Helena, *op.cit.*, 1992, p.103.

<sup>16</sup>  
COSTA, Daciano M. and Souto, M. Helena, *Ver Pelo Desenho, Frederico George*, 1993, p.49.

<sup>17</sup>  
"Cita você [Victor Palla] depois as palavras de Miguel Ângelo: «Falta qualquer coisa ao artista, quer escultor quer pintor que não tenha praticado arquitectura». Belo, muito certo, mas arrego-me o direito de com a devida vénia dizer: «Falta qualquer coisa ao artista plástico que sendo arquitecto não tenha praticado pintura ou escultura»." Miguel Ângelo Buonarroti and Frederico George *apud* George, Frederico, "O lugar do Artista Plástico, Frederico George Responde ao Artigo de Victor Palla", 1948, p.23.

<sup>18</sup>  
"Surge agora outra grande tarefa a cumprir: a integração do valor emocional, nas funções materiais da arquitectura." George, Frederico, *op.cit.*, p. 23.

<sup>19</sup>  
*Ibid*, p. 6.

<sup>20</sup>  
Moniz, Gonçalo E.O.C., *op.cit.*, p. 510.

<sup>21</sup>  
"O que importa é não perder de vista o que de benéfico a Bauhaus nos trouxe, procurar a sua integração num País como Portugal [...]. Um dos princípios em que a Bauhaus se apoiou — a posição da arquitectura não já como «a grande arte», a «mãe de todas as artes», mas simplesmente como uma actividade que, sendo do homem, ao homem se dirige, como o produto do *design* — é, quanto

a nós, válido.” GEORGE, Frederico, *Considerações Sobre o Ensino da Arquitectura*, [1957] 1964, 85.

22

Duarte, Carlos S.(dir.), “4 Trabalhos dos Arquitectos Carlos Tojal, Manuel Moreira e Carlos Roxo: Instalações do Banco Fonseca & Burnay, Av. dos Aliados, Porto; Rualdo, Estabelecimento na Rua de S. José Lisboa”, 1968, p.19.

23

Roxo, Carlos, “Para uma Metodologia da Arquitectura. Estudos Sobre Concepção e Crítica do Belo Arquitectural” [1963], Vol.I, p.30.

24

Carlos Tojal *in* Duarte, Carlos S. (dir.), “Mesa Redonda: A loja de Modas, o Projectista e a Sociedade de Consumo”, 1971, p.22.

25

Manuel Moreira *in* Duarte, Carlos S. (dir.), “Mesa Redonda: A loja de Modas, o Projectista e a Sociedade de Consumo”, 1971, p.21.

26

“Referido portanto ao Meio, é este que define os termos da intervenção do arquitecto como profissional e como cidadão.” Tojal, Carlos; Moreira, Manuel and Roxo, Carlos. “Testemunho dos Autores” *in* “4 Trabalhos dos Arquitectos Carlos Tojal, Manuel Moreira e Carlos Roxo: Instalações do Banco Fonseca & Burnay, Av. dos Aliados, Porto; Rualdo, Estabelecimento na Rua de S. José Lisboa”, 1968, pp.17.

27

“Ritmo e Contradição são, quanto a nós, os termos fundamentais de toda a linguagem estética que, hoje como ontem, considere a realidade e dentro desta, o homem comum, como protagonistas.” Tojal, Carlos; Moreira, Manuel and Roxo, Carlos. “Testemunho dos Autores” *in op.cit.*, 1968, pp.17-18.

28

*Idem, ibidem.*

29

Carlos Roxo *in* Duarte, Carlos S. (dir.), “Três Obras dos Arquitectos Carlos Tojal, Manuel Moreira e Carlos Roxo. Traje, Meia-lua e Crédito Predial Português. Mesa Redonda: A loja de Modas, o Projectista e a Sociedade de Consumo”, 1971, p.24.

30

Roxo, Carlos, *op.cit.*, [1963], Vol.I, p.29.

31

Roxo, Carlos, *Idem*, p.0.

32

Walter Gropius, “Is There a Science of Design?”, [1937] 1962, p.24-25.

33

“«O projectista deve aprender a ver, deve conhecer o efeito das ilusões ópticas, a influência psicológica das formas, côres e texturas, os efeitos de contraste, a direcção, a tensão e o repouso, e deve a prender a captar a significação da escala humana». «Alcances de la Arquitectura Integral» — Walter Gropius”. Roxo, Carlos, *op.cit.*, [1963], Vol.I, p.0.

34

“Nascida do trabalho, a Arte é pois uma actividade eminentemente utilitária[...].”Roxo, Carlos, *op.cit.*, [1963], Vol.I, p.24 and *idem, ibidem*, p.6.

35

“Ora a finalidade da arte é a de todas as actividades sociais — contribuir para a felicidade e para o progresso do homem. [...] Caso contrário não tem utilidade e significado, e desaparece.” Roxo, Carlos, *op.cit.*, [1963], Vol.I, p.24.

36

*Idem, ibidem*, p.23.

37

*Idem, ibidem*, p.24.

38

Herbert Read [1937] *apud* Roxo, Carlos, *op.cit.*, [1963], Vol.I, p.24 and 25.

39

“[...] a Arte procura o Útil para se vitalizar, para existir, bem como o Útil necessita da Arte para se dignificar, para ser de facto útil. Porque Útil e Função são dois factores de uma só finalidade — a socialização da obre de arte...” Roxo, Carlos, *op.cit.*, Vol.I, p.25.

40

Roxo, Carlos, *op.cit.*, [1963], Vol.II, p.32.

41

“Privada pois da sua linguagem, a Arte não é nada, porque não actua, porque se cala.” Roxo, Carlos, *op.cit.*, [1963], Vol.I, p.22.

42

*Idem, ibidem*, p.31.

43

*Idem, ibidem*, p.32.

44

“Diremos então que o arquitecto actua com Imagens, que é um produtor de Imagens. E se a Arquitectura é espectáculo, todos nós sentimos e habitamos essas Imagens em “espaço” ou em volume, em côr ou em luz, em ritmo ou em matéria[...]. “A este mundo exterior, é preciso juntar ainda os mundos interiores, igualmente invisíveis e igualmente essenciais à acção: os sentimentos, os pensamentos dos personagens”(3) [(3) Etienne Souriau em “Architecture et Dramaturgie” de André Villiers e outros, Flamarion, Paris, 1950,p.64.” Roxo, Carlos, *op.cit.*, [1963], p.81.] que vivem dentro e fora da obra, que nela desencadeiam toda a existência humana.” *Idem, ibidem*, p.30.

45

*Idem, ibidem*, p.30-31.

46

"[...] eu pr e utilizada pela sociedade, em cada etapa existirá, bem como o dirige, como o produto do próprio proponho um método de composição arquitetural: chamemos-lhe Método Orgânico Materialista.

É um método experimental, porque sempre, em cada etapa de trabalho, parte da hipótese para a obra acabada, de verificação em verificação vai experimentando formas até induzir a forma final, pronta então a ser construída e utilizada pela sociedade." *Idem, ibidem*, p.85.

47

*Idem, ibidem*, p.18, 84, 85.

48

"É além disto uma forma de "Integração" no meio, e meio significa aqui sociedade; mais do que todas as árvores, todos os montes ou todo o céu que constituem um ambiente natural, o ambiente social é o meio da Arquitectura. Sendo um prolongamento da natureza, a Arquitectura Orgânica não é a sua apologia (superando portanto o próprio conceito Wrightiano)." *Idem, ibidem*, p.85.

49

Alexandre Costa Alves, former student, *apud* Moniz, *op.cit.*, 2011, p.51-52.

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