The Origin of Modern Movement in Architecture – Ideal and Utility Premises

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Abstract. The rising and development of the Modern Movement in architecture has been so far widely dealt with in the specialized literature. In most cases, the focus was primarily on the valuation of creative achievements of avant-garde architecture. Such an approach seems to be one-sided, considering that architecture has been usually a reflection of economic and social changes. The considerations in this article that focus on achieving success by avant-garde artists in architecture can also shed a new light on the issue of shaping purist trends in this area, in the second decade of the 20th century and in the following, in the Weimar Republic, France, Great Britain and the United States.

1. Introduction

Revolutionary methods used by architects focused around the idea of modernity in architecture (dimensional coordination, prefabrication, unification, etc.) had not always brought positive results. Therefore, the author of this article propounds a thesis that the revolutionary changes in architecture, both those initiated formerly by avant-garde creators as well as the contemporary ones, could be hardly regarded as proper or relevant.

2. Development of architecture at the turn of XIX and XX century

In the first half of the 1920s, the Weimar Republic, besides the United States, was one of the fastest developing countries in the world. That is why, in this part of Europe, the public debate on the relationship between architecture and art and technology has been revived once again since the founding of German Association of Craftsmen. As a result, German architectural thought, including residential architecture, has evolved the fastest in the world. In case of the one mentioned it was just natural because at that time, for several decades, the satisfaction of housing needs was treated as a hygienic category.

The decisive influence on the directions of development of residential architecture of that time in Germany (and indirectly also in Europe) was made by two leading academic centers at the end of the 19th century – the Architecture Department of the Technical University of Munich and the Architecture Department at the Technical College in Stuttgart. The widespread recognition of the designers and lecturers in the latter caused that the College gained an informal but honorable name of the Stuttgart School (ger. Stuttgarter Schule). In both these universities the architects’ environments creating in the spirit of respect for tradition have been concentrated. Despite this, they started a close cooperation with avant – garde lecturers from the Architecture Department of the Delft University of Technology (dut. Technische Hogeschool van Delft, The Netherlands). In the second decade of the twentieth century,
Historicism was rejected in both German centers of creating architecture. However, they have become the target of criticism of avant-garde artists – [supporters] of warlike simplicity and the lack of decorations [3, p. 49].

Paradoxically, the greatest contribution to the creation of a modern residential architecture was made by conservative artists – in particular those who were gathered around the earlier mentioned Architecture Department of the Technical University of Stuttgart (P. Bonatz, P. Schmittenhner). Traditionalism was reflecting rational architecture derived from local historical patterns and organic forms. It also showed some convergence with English urban – garden concepts, for example the Gmindersdorf-Reutlingen workers’ estate (T. Fischer, 1903), Drezno-Hellerau (R. Riemerschmid, 1907) and Essen-Margarethenöhö (G. Metzendorf, 1909). That is how it became an opposition to Nazi monumentalism (neoclassicism).

Traditionalists were pushed into a creative nonentity after the Second World War which should be considered as biased and even harmful [15]. They were part of initiators of the creation of German Association of Craftsmen (T. Fischer, W. Kreis, B. Paul, R. Riemerschmid, P. Schultzze-Naumburg and F. Schumacher) and until the Nazi authorities made it illegal they were playing the leading role in it (1934). During the First World War, they developed some prototype solutions that vanished at the foundation of modern standardization in housing. In particular, they included the Staaken-Spandau housing estate near Berlin, in which they abandoned the use of „historical costumes” on the facades, only five types of buildings were used and two functional and spatial systems of flats – one and three rooms (P. Schmittenhner, 1914-1917) [6, pp. 132-148]. The ideological affinity of traditionalism and Nazi ideology became the key argument for conservative critics. In many cases, it was just a convergence of words, for example an Beauty is in order (ger. Schönheit ruht in der Ordnung) – Nazi aesthetics was not [even] an artistic trend, […]. Its sources should be sought in the nineteenth – century urban ideal of art. […] The Nazis were fascinated by the style of Troost, calling it „Teutonic-German”. Meanwhile, the truth was that they were taking patterns from the earlier buildings and styles, the common dominator of which was the desire to create a sense of greatness [of building] [10, pp. 65-66].

3. The beginning of avant-garde in architecture

Going back to the issue of avant-garde in architecture, it is worth mentioning that – in 1925, when Ernst May took over the Construction Department (ger. Dezernat für Bauwesen) in Frankfurt am Main town hall, his views were already inspired by the works of Bruno Taut, Martin Wagner and Otto Haesler. His policy led to the fact that all buildings erected with municipal funds and all planning works were commissioned to architects who were representing avant-garde [14, p. 123]. This meant that avant-garde was not conditioned by social demand – The Maya-led office was also considering applications of investors applying for partial funding of construction with municipal or state money. It was within his competence to accept or reject applications, and that gave him the real impact on those investments. In 1925-1927 Ernst May was also the vice-president, and from 1927, he was the president of belonging to the city [Frankfurt am Main] Building Society [ger. Die Aktiengesellschaft für Kleine Wohnungen] [14, p. 123]. In Frankfurt am Main, a 10-year program of social housing was adopted at that time, which provided for the construction of 1 200 flats a year, for example three-room flat (60 square meters and more) was meant for 5-person family, only if it had occupied one room before. At that time the realization of 24 suburban residential estates for the poor had begun, for example Frankfurt-Römerstadt housing complex (E. May, C. H. Rudloff, 1927-1929). In the spirit of aesthetic purity, the Praunheim estate (W. Bangert, A. Brenner, H. Boehm, E. Kaufmann, E. May, 1926-1930) was also built nearby. 17 great complexes of multi-family housing (ger. Großsiedlungen) were also erected in Berlin at that time. An example was a development of the Spadauer-Siemensstadt estate (Ringsiedlung, O. Bartning, F. Forbat, W. Gropius, H. Häring, H. Scharoun, 1929-1931) funded with municipal money and the building of the GEHAG estate in Zehlendorf (H. Haring, H. Poelzig, R. Salvisberg, 1926-1932). Residential complexes such as these usually had a kindergarten and a primary school nearby, and that made them
an archetype of a school unit. The architecture of these complexes obtained a rhythmical, but at the same time, „semi-industrial” character.

[However inappropriate] The image of the historic Olympus of social housing between Men and Nidda caused the later creation of bizarre values that come more from fantasy than from statistics. […] In years 1926 – 1929, Ernst May built a total of 2,444 new apartments for one hundred thousand inhabitants. Only a slightly worse result was held by the Cologne mayor Adenauer (2,428 flats), in which the city council was dominated by the catholic center party. The best result was achieved in Hamburg (2,577 flats), where the construction director – until being removed by the Nazis – was Fritz Schumacher [16, pp. 112-113].

Another equally important issue in the case of Frankfurt’s housing, was its ability to meet housing needs. In the German housing of that time, the population density index was not being used – it resulted from the number of storeys and flats, and the layout of residential buildings, which in turn led to providing similar conditions of insulation of flats, ventilation of buildings, and equipment and facilities. In creating of residential housing, the archetype was usually referred to a small, detached house with a garden. This was justified when taking in consideration the fact that the majority of social housing estates of that time was located peripherally in the downtown areas. In turn, the height of the buildings did not usually exceed 2 or 3 storeys. The area of this territory should enable its intensive greening and equipping with recreational facilities. The estates turned out to be extensive. Thus, it made it impossible to meet the mass housing needs of the population. The similar situation occurred then in the United States. However, the housing there lacked a European, social character. Therefore, at the end of the 1920s, in Germany, projects in the spirit of the „new reality” (new objectivity) were sporadically undertaken. The renown of the Modern Movement in architecture was attributed to the implementation of the Weissenhof estate in Stuttgart (1927). Compared to the construction progress achieved at that time in Frankfurt, the Weissenhof was only a small project, consisting of twenty – one houses with sixty – three flats, which – unlike the loud self – promotion of the organizers said – could not bring much to the topic of „small apartment fever” [17, p. 110]. It should be also mentioned, that the apartments in this residential complex were as much extravagant as horrendously expensive – all houses were rented except for two. Author of these, Le Corbusier, ordered tenants to pay five thousand marks [of the monthly rent, which ranged from 2,500 to 3,000 marks]. It is not surprising that despite the housing hunger, they have been empty for the whole year [17, p. 160].

Ernst May was the first to present not only isolated buildings or a single housing estates – as Le Corbusier did in Pessac or Walter Gropius in Dessau-Törten – but a set of numerous housing estates with many thousands of flats in the „New Construction” style. [16, p. 110]. Another issue was that he used – the power of public statement to implement new ideas. (Figure 1) [16, p. 111].

[However] Celle was the first city in Germany to engage an avant-garde architect in the work on housing complexes financed by public funds. […] A small Italienischer Garten estate was erected there first. [O. Haesler, 1924-1926]. This estate consisted of [detached] buildings in cubic shapes [14, p. 124]. Its development was built in accordance with the course of the existing street layout. However, Georgsgarten estate built in a row system was considered the first to fully meet the assumptions of the German architectural avant-garde (O. Haesler, 1925-1927).
German cities were divided into those which had some stylistic pluralism [in architecture] and those where architecture was only created in a creative way that developed traditional patterns. […] Nota bene in the scale of entire Germany among subsidized settlements, the majority of estates was erected under the direction of architects developing more traditional forms. [14, p. 124]. This has become particularly noticeable in large urban centers and the established architectural tradition of Hamburg and Munich. Housing complexes realized there (in a compact urban structure and beyond) were characterized by a landscape layout, for example Munich-Friedenheim (B. Biehler, R. Fick, A. Seifert, 1928-1930), semi-courtyard and in-line – Munich-Neu-Ramersdorf (O. Delisle, B. Ingwersen, R. Berndl, 1928-1930) or referring directly to the Viennese superblock with an inner courtyard – Munich-Borstei (B. Borst, OE Bieber, 1924-1929), Munich-Neuhaaraching (T Lechner, F. Norkauer with the team 1928-1930) and Hamburg-Poßmorweg (E. Elingius, K. Schneider, G. Schramm, 1927-1928). Traditional architecture (steep roofs) turned out to be traditional in them, even in the row building systems, for example the aforementioned Alte Heide in Munich and Am Walchenseeplatz (C. Jäger, 1928-1930) and Neuhausen (H. Döllgast, 1928-1930).

Unlike Frankfurt, the Hamburg area did not include a sufficiently large space […], which is why mainly four-storey multi-family houses were built. Technical and construction experiments were limited to one residential unit in line system. The homogeneous face of the city in the new districts was achieved by means of a rule requiring the buildings to be supplied with red-brown clinker façades typical of northern Germany [16, p. 113].

It is also worth noting that residential complexes with avant-garde features were created outside Germany too, for example La Cité de la Muette in Drancy in France (E. Beaudouin, M. Lods, 1929-1931). As part of the pilot program for the construction of „residential skyscrapers”, there were 1 250 apartments built in comb and row systems. The buildings consisted of 3 floors, 4 and 15, and were built in a steel frame unique to those times, filled with prefabricated reinforced concrete slabs. The La Cité de la Muette residential complex was erected in a single-family housing area. Eventually, it remained uninhabited due to the terrible acoustic, thermal and humidity conditions prevailing in the buildings as well as the lack of road and service infrastructure.
4. Local government regulation in architecture

In the nineteenth century, in the United States and Great Britain, architectural designers’ circles made efforts to institutionalize this profession and ensure its proper legal protection – in 1834 the Royal Institute of British Architects (RIBA) was established, and in 1857 the American Institute of Architects (AIA). The rules that the members had to comply with were enacted. Professional qualifying examinations, licenses and eligibilities have been introduced [5]. In France, at that time, the Academy of Architecture was founded (fr. l’Académie d’Architecture, 1840). Academy gathered distinguished personalities of the world of culture and art., whose activity was related to the status of the architect’s profession, its character and social mission. At the end of the second half of the nineteenth century, the Association of Diplomatic Architects was founded by graduates of national higher art schools (fr. Société des architectes diplômés par le gouvernement – SADG, 1882). Its members undertook intense efforts to create a legal framework for the professional activity of an architect. At the beginning of the 1920s, they brought, among other things, a criminal sanction for a person who unlawfully used a profession title (1924).

Paradoxically, the initiation of the convening of the first Congress of Modern Architecture (apart from S. Giedion) ran and independent project activity in the field of architecture without having required education in this area (Le Corbusier 1917-1923). Wherefore, the „master of purity in architecture” decided to cooperate with his cousin (P. Jeanneret, 1923) a graduate of the School of Fine Arts in Geneva (fr. L’École des beaux-arts de Genève). The German occupation of France and the immediate arrival of the latter in the resistance movement meant that the „master of purity in architecture” found himself in a difficult material and professional situation. Soon, however, in the times of the Vichy government’s collaboration with the Nazis, the French Association of Certified Architects granted, by the virtue of law (fr. Loi du 31 décembre 1940 instituant l’ordre des architectes et réglementant le titre et la profession d’architecte) to creators – without authorization diploma to pursue the occupation – Auguste Perret, Eugène Freyssinet, Le Corbusier [1941] [2, p. 112]. In accordance with the provisions contained in Article 2. of this act, people who do not have French nationality and do not have and adequate education but who have significant creative achievements may have obtained the right to practice profession of the architect.

Against this background, it is worth of mentioning the recognition of the work of „the Pope architectural avant-garde” in the United States (Le Corbusier) – This visit, although very intense- during the month of 21 lectures – turned out to be an Atlantic misunderstanding […] The tragic hero Le Corbusier, seeking publicity, on the day of his arrival was also neglected by the New York press [and equally by the American architects who, without any exception, refuse to designate him as an architect]. He probably thought that the rich Yankees would greet him in a flash. It will make a great souvenir with the Manhattan background. – Jacob, where are the reporters? – asks his translator. He, trying to soothe an awkward situation, hands in a five-dollar bill to an accidental photographer who simulates taking photographs. Over the following weeks, Le Corbusier, while browsing the press, continues to ask: – Where is my picture in the New York harbor? [12].

The Modern Movement in architecture was created on the wave of contestation of traditionalist premises – defined as retrograde. Le Corbusier grew up in a time when deco of the typical bourgeois house – heavy decorated furniture, plush upholstery and gilding and ubiquitous trinkets – became so exaggeratedly ornate that the reaction to this was belligerent simplicity and lack of embellishments were understandable, though not necessarily praiseworthy (the extreme opposite of exaggeration is most likely to be another form of exaggeration, and not antidote to it) [3, p. 49].

On the margins of this, it would be worth noticing that the pretty-bourgeois tastes ridiculed by avant-garde authors and resulted not only from sense of aesthetics and beauty of that time (common), but above all from practical premises. Well, a thick, opaque window curtain, fabric wallpaper and a canopy over the bed improved the thermal conditions in the living room – its cubature was often much larger
than those contemporary to us now. In turn, numerous wall and ceiling decorations were aimed at the optical adjustment of size of the room to the tenant.

Everything indicates that the activities of avant-garde architects were accompanied by the social ostracism. *When the [exhibition] of the Weissenhof housing development attracted visitors from around the world […] in the suburbs of Bordeaux’ Pessac estate, an act of sabotage occurred, an unprecedented in the history of construction […] Some of the uninterrupted windows […] were walled up to contain the old, large lumber, various sheds were built on, polychrome was weathered or covered with a layer of paint […] in the nearest neighborhood grew villas corresponding to petty bourgeois tastes, and finally the whole estate was degraded. And yet, both the principal and architects imagined the Pessac would be a great contribution to progressive French thought to the construction of socially most needed housing* [11, pp. 49-50].

On the wave of the social ostracism towards avant-garde currents in arts and architecture, the institutionalised resistance – traditionalist environments also solidified. However, this term seems inadequate. In fact, it referred to the rest of creators incomparably more numerous than that represented by avant-garde advocates in architecture scattered over Europe.

With the greatest resistance supporters of the Modern Movement in architecture met up in Germany. Paradoxically, it happened five years before the Nazis come to power – *In the spring 1928, the »Block« association was founded in Berlin, gathering traditionally oriented architects who saw themselves most of all as opposition to the avant-garde association »Ring«.*

Its members, among others including German Bestelmeyer and Paul Schultze-Naumburg, agreed that »in the currently implemented construction tasks, the main emphasis should be placed on the feedback of society and the natural conditions prevailing in our country. At the same time, they assured that they would »thoroughly examine all the possibilities and proposals that refer to new materials and construction forms« without neglecting the crafts heritage. They rejected absolutely opened prematurely by their colleagues from »Ring« association, a campaign of fashionable products, which they consider as threatening to a healthy development«.

Above issue should be further elaborated. Even in the first years after the end of the Second World War, the basic building materials in housing was ceramic brick, wood, stone and rolled up steel. In turn, the main way of building’s moisture protection was to choose the place of its foundation and the depth associated with it, that is above the permanent groundwater level. The rainwater drainage from the building in the cities was carried out by means of a steep roof covered with ceramic roof tiles, slate, zinc sheet and exceptionally cooper (prestigious buildings). Bituminous materials were used sporadically mainly by replacing the costly non-ferrous sheet in the horizontal insulation of the basement walls. This was the architecture and craft culture based on experience and tradition of centuries (Figure 2).

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1 Im Frühjahr 1928 wurde in Berlin der »Block« gegründet, eine Vereinigung traditionsorientierter Architekten, die sich primär als Gegenformation zum avantgardistischen »Ring« verstand.

Ihre Mitglieder, zu denen unter anderen auch German Bestelmeyer und Paul Schultze-Naumburg zählten, waren sich einig, daß »bei den Bauaufgaben unserer Zeit wohl ein eigener Ausdruck gefunden werden muß, daß aber dabei die Lebensanschauungen des eigenen Volkes und die Gegebenheiten der Natur des Landes zu berücksichtigen sind. Sie gelobten, »allen Anregungen und Möglichkeiten, die neue Werkstoffe und Werkformen betreffen, mit wacher Aufmerksamkeit« nachzugehen, allerdings ohne dabei »Ererbtes vernachlässigen und bereits Gekonntes verlieren zu wollen«. Die »allzu voreilige Werbetätigkeit für modische Erzeugnisse, die eine gesunde Fortentwicklung gefährden muß«, wie sie etwa ihre Kollegen vom »Ring« an den Tag legten, lehnten sie kategorisch ab [6, p. 267].
First avant-garde realizations in housing revealed the lack of appropriate techniques and technologies for this purpose. The avant-garde creators associated high hopes with the mass usage of concrete, followed by the industrialization of housing – Many architects were interested in concrete, but few were successful using this material. [For example, in an extremely professional environment of the Dutch architectural avant-garde] Oud’s early works were created using brick and stone. After his monumental brick blocks in the districts of Rotterdam, Spangen and Tussendijken, Oud designed white residential buildings in Hook of Holland and Kiefoek in the south of Rotterdam. Based on these achievements in 1926 he was asked to design a residential building in the Weissenhofsiedlung estate in Stuttgart. He could use the concrete for the first time.

In the meantime, in Amsterdam [Amsterdam Watergraafsmeer] the process of the first concrete usage in housing was heading towards an end of the realization: Betondrop, concrete housing estate, the suburb, where eleven methods of ascending a building with the use of concrete were used [J.B. van Loghem, 1922-1924]. Cubic forms, flat roofs and elevations in white and gray give this area a look that differs significantly from the architecture characteristics of the housing developments implemented so far, with façades made of brick and roofs covered with tiles. However, the Betondrop development team maintains a residential character by introducing a small spans of structural ceiling [3, pp. 40-41].

[Although] in the years 1910-1920 [concrete] became almost the trademark of modern architecture [17, p. 186] – buildings were usually put up in traditional technique or partially with a brick with a use of wood and steel elements. The whole was then plastered to obtain a monolithic technique effect. Then the feeble state of knowledge in the field of stress pattern in this secondary structural system became a cause of the reason for the frequent occurrence of failures in the construction of the building, and they were numerous. By that means the architecture was followed by a period of „non-permanent techniques and technologies”.

By contrast the first large-scale prefabricated buildings in Europe were built in a residential complex in Berlin-Friedrichsfelde (Splanemann-Siedlung, M. Wagner, 1926-1930). From the 7-ton concrete slabs, formed on the construction site (7.5 x 3.5) vertical divisions were lifted up. However, ceilings, cellar walls and roofs were made in traditional technique. The necessity of using a crane on the construction site, the difficulty of assembly of prefabricates and the high cost of manufacturing resulting from short-run production increased the financial outlay to the extent that a decision was made to stop further attempts in this area.
This issue returned in the Soviet Union, where under the supervision of German architects and constructor engineers, the production of large-block concrete elements from pumice concrete (metallurgical pumice slag) was launched. One-layer wall partitions (0.2 m) were erected from them. They were to replace the nearly three-meter-thick three-layer brick walls made of solid bricks with air voids (6-8).

Contrary to the expectations, the new baffle was characterized by greater thermal transmittance than the one made of bricks (70%). As a result, a dew point occurred inside of it which resulted in permanent dampness and further deterioration of thermal insulation. The acoustic parameter turned out to be equally unfavourable. Similar physical values of vertical external brick walls and those made in industrialized technology could have been obtained only after using prefabricated elements made of pumice concrete with more than doubled thickness (0.44 m).

Finally, the activities in the field of large-scale prefabrication undertaken in the interwar period in the Western European countries (Finland, France, Germany), stopped in the experimental phase (1930).

The dampness of the vertical partitions largely influenced the aesthetics of the buildings – it led to appearance of the stains on the facade plasters and accelerated break-in of the paint coatings. This situation arose even in housing built in traditional technology, for example in the avant-garde housing estate in Bruchfeldstraße in Frankfurt am Main. However, in his case it resulted from the lack of mastery in the techniques of covering buildings with a flat roof.

A flat roof or basically roofing a building with a flat roof in avant-garde architecture, has grown into an ideological dogma. La Corbusier summarizes the results of an international survey [flat roof] its own rights: »a flat roof is much cheaper and requires no maintenance costs’, because a flat roof is nothing but a pursuit vision of typical form embracing all regions regardless of climatic and economic conditions« [17, p. 137].

This was contrary to opinions of professionals and the coming from everywhere criticism of Cubist and purist architecture – Hermann Muthesius, co-founder of Werkbund wrote in 1927: (…) »the shape of cubes propagated today plays significant role of bringing buildings to the simplest geometrical forms. (…) […] Why to defend a flat roof needed today for reasons of formal to reasons of cheapness? The essence of building based on cubes has nothing to do with practicality« [17, p. 137].

Solutions then in that matter were based on wooden beams arranged with a slight slope, covered with boards and roofing felt (3.5%). To these beams a soffit roof was headlining made of boards was installed on which limestone plaster was tanned on reed mat. The thermal insulation was a small air gap decreasing towards the gutter. Due to savings and stylistic (architectural) reasons, no attics were generally made. Instead of making it, a small eave (0.5) sometimes appeared, which was hemmed with a sheet of zinc. The roofing of the building shaped in this way did not protect its exterior walls against flooding by precipitation. Condition of this deteriorated in case of snowy winters. Lack of attic was also a serious threat due to the spread of fire on an easily inflammable roofing between the living sections. Therefore, avant-garde housing was accompanied by significant operational nuisance - low acoustic and thermal insulation as well as dampness. For this reason, buildings of this type were completely unsuitable for settlement in a harsher climate than Central European (for example Russian).

Undoubtedly, an important issue related to the avant-garde residential architecture was its monotony (repeatability) and the poorness of artistic solutions. This architecture seemed interesting only on the background of the historical one. An attempt was made to remedy this by applying the principle of contrast of colours and deep chiaroscuro and using „strong plastic rhythm”. However, these actions were ultimately unsatisfactory.
5. Conclusions

Architecture should be created outside the discourse of ideological nature. It should primarily serve the satisfaction of social needs in the field of traditionally understood architectural aesthetics and building culture. A great example of such actions was to announce the Accepter manifesto by Swedish architects and artists three years after the declaration from La Sarraz (G. Asplund, W. Gahn, S. Markelius, G. Paulsson, E. Sundahl i U. Åhrén, 1931).

The intention of the authors of this manifesto was to become a platform for social debate on modern art, such as architecture and housing – it is impossible to stop the human desire to decorate space, but it should be cleaned up from time to time (Figure 3).

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