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## FROM *VENUSTAS* TO *FIRMITAS* IN SUSTAINABLE ARCHITECTURE

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### OD *VENUSTAS* DO *FIRMITAS* W ZRÓWNOWAŻONEJ ARCHITEKTURZE

#### Abstract

The shape of contemporary architecture – especially pro-ecological architecture – is attributed to the goals that can be associated with the Vitruvian *Utilitas*. The quality of the final results based on the evaluation of the scientifically researched and optimized parameters. Paradoxically, this rational process leads to the intuitive category of *Venustas*. Is such a transition possible at all? Is it only one of the ways to understand the implementation of the idea of *Firmitas*, as a way to minimize the ecological footprint. Is there a space of association for an evolutionary and rationalistic description of reality with an undefined aesthetic category? What kind of changes does it require? The article attempts to outline the answer to this.

*Keywords: proecological, sustainable, architecture*

#### Streszczenie

W kształtowaniu współczesnej architektury, zwłaszcza proekologicznej, prymat przyznaje się celom, które można przypisać do witruwiuszowskiej kategorii *Utilitas*. Ostateczna opinia o jej jakości jest skutkiem optymalizacji parametrów wybranych w wyniku badań naukowych. Paradoksalnie jednak ten racjonalny proces prowadzi do konieczności odwołania się ostatecznie do intuicyjnej kategorii *Venustas*. Czy jednak takie powiązanie jest w ogóle możliwe? Czy jest ono jedynie swoście rozumianą realizacją idei *Firmitas* jako drogi do minimalizacji śladu ekologicznego. Czy istnieje przestrzeń, w której taki ewolucyjny i racjonalistyczny opis rzeczywistości wiąże się z nieokreśloną kategorią estetyczną? Jakie zmiany wymagane są w rozumieniu tego ujęcia? Artykuł podejmuje próbę zarysowania odpowiedzi na ten problem.

*Słowa kluczowe: proekologiczna, zrównoważona, architektura*

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## 1. Introduction

Sustainable development is, by far, one of the most influential ideas of our time. It shapes not only the legal and political systems of many countries but also the way of lives, views, and expectations of individuals and communities all over the World. Over the past three decades, it has become an important reference point for many cultural, social and business projects. It is also an idea based strongly on rationalism, and only to some small extent referring to intuition. The basis for most of the considerations it contains is the knowledge and data provided by scientific research.

It is said that architecture is a mirror of the society. It reflects the values that govern it, and at the same time, it is shaped by those ideas. So it is only logical that the issues of sustainable architecture have become an essential part of the discipline and are responsible for its overall picture today. Taking this into account, the careful monitoring of its development in that realm seems to be essential and crucial. Only an accurate and multithreaded analysis of its development can make it possible to describe the state of affairs. It can allow for potential threats and profits from its development to be estimated.

This article attempts to approximate this complex issue in a small fragment. It regards the changes that have taken place in recent years in the role of aesthetic. It contributes in a tiny part to the description of a complex and extensive design approach. It references a transition towards a mostly emotional attitude in the somewhat rational sustainable architectural design process.

## 2. Sustainable architecture – a research-based design approach

The presence of a considerable number of entirely different views on sustainable development in the public discourse is the fundamental problem one has to face researching this issue. In fact, the critical question related to sustainable architecture is the possibility to create a definition. There exist a considerable number of opinions that sustainable architecture is more of a design attitude than architectural theory, in its traditional sense. For this reason, it is impossible to define it; one can only specify the issues that must be considered in the project. Traditionally, sustainable design concerns several areas such as ecology, economics, energy, society, and health. This division is sometimes carried out differently and maybe broken down. However, in all cases, it contains all of the abovementioned. They constitute a universally accepted core. Guidelines one should always refer to, even if the very definition of what is meant by them is the subject of discussions. In this light, many designers considered it necessary to create a set of quite general guidelines that should be considered and followed from the very beginning of the project. In theory, the more fully the project finally includes them, the more it would be meeting the requirements set by sustainable architectural design. This concept is quite widely disseminated and widely accepted. If not for any other reason than due to the heuristic nature of the design. It gives the opportunity to preserve the principles of sustainable architecture and at the same time takes into account the uniqueness of each task.

However, this creates some problems related to the development of methods of evaluating the expected effects and the possibility of comparing them between projects. Without such a comparison system, it is difficult to assess to what extent a particular project was adapted to the requirements of sustainable development, and to what extent the solutions adopted in it are an adequate response to the problems. From the very beginning, the call for proper

assessment plays an essential part in the theory of sustainable design. It is particularly important regarding the role of economic factors in architecture. Moreover, the potentially high risk of distortion that those factors are carrying. These were the reasons for the development of the certification systems. The primary purpose was to organize the process, to adapt it to market conditions and to determine the efficiency of the solutions. However, in the long run, they can be seen as tools for shaping the principles according to which the design and implementation process should take place.

### 3. Rational analysis of effects

One of the underlying problems is, as already mentioned, the evaluation of the obtained effects. It is crucial for creating a full picture of the effectiveness of the adopted pro-ecological solutions.

The attempt to implement such a system was the establishment in 1990 of the British BREEAM. It is the first certification system on which practically all the next ones have been based. Starting with LEED (1998), through CASBEE, HQE, Green Star, and ending with DGNB. The reason for the creation of the system mentioned above was, an attempt to evaluate buildings and implementation of the principles of sustainable development, and thus the ordering of this phenomenon. Their influence turned out to be deeper and led to interference in the design process. As for all quality research in industry, here as well, the basis is to distinguish features that will be assessed. Roughly, these features can be divided into:

- Measurable (quantities) – that can be measured and expressed using appropriate physical units.
- Non-measurable (attributes) – which can only be described in words, two or multiple layers.

The former includes all physical values related to the building. It should include a large group of essential issues in the field of building physics, related to energy efficiency and thermal insulation of the building. The latter includes social issues, challenging to describe entirely even in statistical terms. Economic problems can be qualified for transitional features, based on the traditional mathematical approach and psychological components, especially in the matter of making decisions in undetermined conditions and with unmeasurable data. Sometimes also seeking to make decisions based on non-numeric data, such as opinions and beliefs. Moreover, that is where the aesthetic problems would have to be considered. However, since it is an issue of the high level of uncertainty, it is present only in a few systems like The Living Building Challenge – the certification aiming to be the avant-garde. It was created not as a market-related tool but a goal setting instrument for recognition and research of further problems. In the more popular systems, such issues are mostly omitted. If the attempt was made, the criteria were inevitably set to more measurable means. A good example is the quantification issue in DGNB system, which introduced the so-called *Aesthetic Quality Criteria Group*. At first, it consisted of two criteria: *Design and Urban Planning Quality through Competition* and *Integration of Public Art*<sup>1</sup>. Both of them did not, however, concern the issue of quality but were referring to the process of selection of design and usage

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<sup>1</sup> Excellence Defined. Sustainable building with a systems approach; access: [dgnb.de](http://dgnb.de).

*of art objects. Later the third criterion was introduced – Layout Quality*<sup>2</sup>. However, again it was set to be as close to measurable features as possible. So instead of intuitive description a rational, and possible to quantify, set of requirements was introduced.

#### 4. Sustainable development in architecture

Many factors can be indicated as the reasons for the success of the ecological design, and especially sustainable architecture. Undoubtedly, some of them are related to the influence of the legal and economic environment in which the projects are created and are mostly up to the rational attitude resulting from functioning in specific conditions. Considering the “internal” factors, one may attempt to generalize and bring the issue to several tendencies. Characteristically, they come from emotional premises but are supported by a rational approach.

One of them is the belief that this ideology has a chance to perform a function that according to some theoreticians<sup>3</sup> no other has for the last four centuries. It can also become a common ideological attitude for a significant part of the world’s community. It is due to its considerable multithreading and openness to various attitudes. It enables it to adapt to the changing expectations and become the perfect answer to the diversity of the modern world.



III. 1. Prague, City Green Court. The need to underline green design – a label of LEED certification next to the main entrance – often the only visible sign of sustainable design; design R. Meier & Partners (2012) (photo author)

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<sup>2</sup> *Ibidem.*

<sup>3</sup> P. Trzeciak, *Historia, psychika, architektura*, Państwowy Instytut Wydawniczy, Warszawa 1988, p. 10.

Secondly the conviction of the social mission that architecture is supposed to fulfill. Also, it contributes to the broadening of interest in sustainable development. This way of thinking was present in various forms, in all epochs. It was – according to J. Żórawski – a sort of requirement for the architectural ideas. The lack of commitment, on either side, is in his opinion, unimaginable in this case. Any object intentionally created by a human being must be ... *involved in some action*<sup>4</sup>. Over the centuries, these goals have changed, although they initially all served social needs – mainly integration. Contemporary pro-ecological movements, strongly marked with ethical elements, are an ideal continuation of this age-old tradition. It is worth emphasising that despite the general orientation towards the future, the issues of respecting the past plays a significant role in sustainable architecture.

This approach aimed not only at raising the importance of the problem by showing its roots in the distant past of thought and philosophy. It is also a purely pragmatic use of proven and recognized by the majority of social patterns. It seems it is the most effective method for solving some design issues. There is a significant touch of the pragmatic approach to the sustainable design in architecture. It is not an approach characteristic only for pro-ecological or sustainable architecture. Nevertheless, it is firmly present in it. In the words of N. Foster: *As an architect, you design in the present, with the awareness of the past for the future which is fundamentally unknown*. This tendency is also manifested in the frequent reference to the idea of Vitruvius, both directly in its original version<sup>5</sup>, as well as through its supplementation with new<sup>6</sup> or reinterpretation, regarding contemporary issues<sup>7</sup>.

## 5. From rationality to intuition

To this point in time, the issue of the aesthetics as a factor of crucial importance for its reception appears so troublesome for pro-ecological architecture. In principle, it concerns issues left intentionally on the sidelines, which results from strongly rationalistic attitudes shaping the issue of sustainable construction and its evaluation. The parameters assessed, which enjoy the most general recognition and credibility, do not take into account visual issues, shape or form. In the simplest terms, visual attractiveness is not necessary, even when implementing the most ambitious sustainable projects<sup>8</sup>.

This last opinion results directly from the rational approach to the subject. The characteristic features of eco-friendly buildings are not in their external appearance but the right assumptions and their implementation. What is more, as emphasized, for example by J Wines<sup>9</sup>, following the form in most cases leads to the denial of the underlying assumptions of sustainable architecture – e.g., the requirement of saving materials and energy.

In the broadest sense, the issue of beauty is one of the most complex issues. Its considerations go far beyond the scope of this article. In the case of sustainable construction, however, it is the subject of a taboo, or at least traditionally pushed to the background.

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<sup>4</sup> *Ibidem*, p. 230.

<sup>5</sup> Th. G. Smith, *Vitruvius on Architecture*. Monacelli Press, Nowy Jork 2003, p. 56.

<sup>6</sup> W. Mikoś-Rytel, *O zrównoważonej architekturze ...*, *op.cit.*, p. 164.

<sup>7</sup> E. Niezabitowska, D. Masły, B. Komar, *Oceny jakości środowiska ...*, *op.cit.*, p. 16.

<sup>8</sup> L. Hosey, *Kształt zieleni: estetyka, ekologia i design*, Island Press. Wersja Kindle, p. 5.

<sup>9</sup> *Ibidem*.

Practically and endlessly, the statements of architectural practitioners and theoreticians, emphasising the unattractive visual nature of forms from this trend, can be quoted. An example of this was the statement of Peter Eisenman from 2009 when he said that the words “architecture” and sustainable have no standard features<sup>10</sup>. On the other hand, Germaine Greer thinks that the person who will be the first one that manages to design a beautiful house with a zero ecological footprint will have to show a genius comparable to that of Brunelleschi<sup>11</sup>.

In a less radical version, which is much more based on the assumptions of achieving environmental goals, this is the conviction expressed by R. Viñol. In his opinion, in sustainable architecture design, there is no room for style. The justification for this approach is, of course, the attitude aimed at achieving the objectives to the broadest extent possible. Any restrictions not based on accepted contexts (like style) are therefore out of place here<sup>12</sup>.

The obstacle was probably also the bad social connotations and the lack of public discussion on the subject. It had caused uncertainty about the visual aspect of sustainable architecture, including its identification layer. What is striking here is the general lack of enthusiasm manifested both by architects and the media. The underlying attitude is explained by, for example, Peter Eisenman<sup>13</sup>. Undoubtedly, the popularity of such an attitude influences the inhibition of research into the phenomenon and its development.

Hegger additionally links this reluctance to the roots of the idea itself, which are in the communities that contest existing traditional forms<sup>14</sup>. At the same time, they were often groups that translated the technological efficiency of the object over its artistic expression, which was partly due to functionalism or rather utilitarianism. In extreme cases, when the pursuit of beauty was identified with unnecessary complication (again on the ground of functional and technical approaches to architecture), it was becoming undesirable.

The problem is still deepening now, due to market rules favouring technical innovations and effective selection mechanisms<sup>15</sup>. Paradoxically, however, the same factor influences the ever-growing need to search for a common visual language for designing. In a world characterized by the brands of companies and symbols associated with them, the “*inducing*”<sup>16</sup> character of architecture based on its visual properties gains vital importance.

At the same time, aesthetics is not just an addition to an architectural object. On the contrary, it was and still is considered a critical element constituting architecture and its distinctive element. The reference to Vitruvius and his triad appears here again. It is through *Venustas* that architecture is characterized and without it, it is considered as purely engineering. In the case of sustainable design, it is true that the philosophy of design is more than the style<sup>17</sup>, but at the same time, the essence of balance is maintained between aesthetic, environmental, social and economic values. This manifestation of spirituality is one of the principles postulated by B. Edwards, referring to pro-ecological

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<sup>10</sup> *Ibidem*.

<sup>11</sup> *Ibidem*.

<sup>12</sup> *Ibidem*.

<sup>13</sup> Hegger, *Energy Manual*, p. 21.

<sup>14</sup> *Ibidem*.

<sup>15</sup> *Ibidem*.

<sup>16</sup> U. Eco, *Pejzaż semiotyczny*, p. 321.

<sup>17</sup> Mikoś-Rytel, *O zrównoważonej architekturze...*

architecture<sup>18</sup>. However, the sign of the times is the preference for *open*<sup>19</sup> concepts that can not be described, but only those that have *family resemblance can be pointed*.

Recent sociological and psychological studies provide more rational arguments for including the intuitive category of beauty in rational evaluation systems. It has been shown that it is crucial for the receipt of items and their evaluation<sup>20</sup>. Often, the emotional attitude towards the object depends on the quality beyond the physical or functional ones. It is the intuitive evaluation of the property that underlies the evaluation of practically any object used by man. Buildings are not a significant exception here. As rightly noted by L. Hosey, our attachment does not result from the chemical composition of materials or the question of biodegradability. It is the result of a joint impact on our reason and feelings<sup>21</sup>.

## 6. The life cycle

This conclusion was especially crucial regarding the concept that has become important in sustainable design. The striving to describe building design processes and related energy consumption have led to the inclusion of these issues throughout the life cycle of a building. This idea was derived directly from the Vitruvian triad – but its understanding has significantly expanded. In his work, Vitruvius writes about the need to consider durability, purposefulness, and beauty<sup>22</sup>. At the same time, his definition of durability – the appropriate shape of the structure, the proper foundation and selection of materials, can be easily found in the modern language as construction safety and material durability. These issues are directly related to the life cycle issues and considered as a significant factor for sustainable projects. The necessity to extend the life cycle of the facility is related to the minimization of ecological and economic costs<sup>23</sup>. These are purely rational premises aimed at implementing assumptions from ecological and economic contexts of sustainable construction.

In the LCB analysis, time becomes a parameter in the context in which the effectiveness of the adopted solutions is being examined. The importance of this issue increases consistently with the development of energy conservation strategies. The introduction of the building's lifecycle expenses in the field of interest led to deliberations on the costs of its production and demolition. These two stages considered in the context of a building's LC constitutes a significant part of the costs – regarding both energy and the environment. In this case, the direct costs do not play an important part, so most of the attention is paid to the expenditure incurred in the manufacture, transport and disposal and storage of waste<sup>24</sup>.

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<sup>18</sup> B. Edwards, *Sustainable Architecture W: Architectural Design 04/2001*, Londyn: Architectural Design, 2001.

<sup>19</sup> M. Weitz, *The Role of Theory in Aesthetics* [online]. The Journal of Aesthetics and Art Criticism, 15/1956 [dostęp: 02.04.2012] p. 27–35. Dostępny w: [prettydeep.files.wordpress.com/2013/01/weitzroleoftheory.pdf](http://prettydeep.files.wordpress.com/2013/01/weitzroleoftheory.pdf), p. 28.

<sup>20</sup> L. Hosey, *The Shape of Green: ...*

<sup>21</sup> *Ibidem*.

<sup>22</sup> Vitruvius, *O architekturze ksiąg dziesięć, op.cit.*, p. 32.

<sup>23</sup> A. Baranowski, *Projektowanie zrównoważone w architekturze, op.cit.*

<sup>24</sup> A. Pearce, Yong Han Ahn and HanmiGlobal, *Sustainable Buildings and Infrastructure: Paths to the Future*, NY: Routledge, London, New York, 2012, p. 147.

An example illustrating this issue are Italian towns from the Renaissance period. The buildings functioning there for years in an unchanged form (only with modernized infrastructure), can boast, in this approach, an exceptionally favourable ratio of energy balance.



III. 2. Venice – an extreme example of aesthetics influencing the Life Cycle of a city and buildings. Despite lost of most of its original function Venice profits from the unique aesthetic values. (photo author)

## 7. Summary

Despite the postulates and attempts to create a coherent visual language for sustainable architecture<sup>25</sup>, there are virtually no schemes developed that could fill this assumption. Only different forms of greenery introduction to façades and roofs as well as the use of renewable energy devices are perceived as a declaration of belonging to pro-ecological trends. Regardless of the quality assessment of these solutions, they are only a substitute for the comprehensive visual system. Of course, the attempts to integrate technologies into the building's body, often give spectacular results. However, the balanced approach in design still lies in the theoretical sphere, not in the form of the object. No doubt, it is the rational and pragmatic attitude that is responsible for this situation. At the same time, it is also a sign of the times – characterized by multi-direction and even permissive. In social perception, the semantic layers of an object belong to the domain of architectural designers and critics and do not constitute such an essential element. This lack of in-depth reflection affects the cultural behavior of society<sup>26</sup>.

The rationalistic idea that shapes sustainable design affects this situation directly. The requirement of extensive analysis and adoption of solutions to problems in many, often distant domains, enforces significant precision and an analytical approach in design. It leaves little room for intuitive, talent-based solutions. Instead, it directs the design process to the production of documentation requiring absolute compliance with the contractor to maintain the design assumptions. This approach is in contradiction with the uncertainty of art present in art<sup>27</sup>.

The analysis of enormous data sets and their development also goes beyond the capabilities of the human mind. The talent is being replaced by a computer calculation. Without denying its clear advantage, one should remember the risks associated with it – especially for intuitive action that is not supported by data that can be parameterized<sup>28</sup>. The problems of analysing the energy and economics come to the forefront in line with the holistic, systemic approach<sup>29</sup>. At the same time it leads to a shift from the subject to the processes. Leading to a specific diminishing of the meaning of the form, replacing it with the requirement, ensuring proper operational parameters without differentiating the means for this.

In this situation, the test results indicate the importance of aesthetics in the reception of objects are the chance to preserve the Venustas. The difficulty is the lack of an unambiguous answer to how to achieve the right quality of these solutions – remaining for the most part beyond the analytical capabilities in the sphere of talent and intuition.

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<sup>25</sup> L. Hosey, *The Shape of Green...*

<sup>26</sup> Zielonko-Jung i Marchwiński, *Łączenie zaawansowanych i tradycyjnych technologii ...*, p. 22.

<sup>27</sup> K. Kalitko, *Architektura ...*, p. 28.

<sup>28</sup> *Ibidem*.

<sup>29</sup> A. Baranowski, *Projektowanie zrównoważone w architekturze*.

## References

- [1] Baranowski A., *Projektowanie zrównoważone w architekturze*, Wydawnictwo Politechniki Gdańskiej, Gdańsk 1998.
- [2] Carr N., *The Glass Cage*, W.W.Norton&Company, Kindle Edition.
- [3] Eco U., *Pejzaż semiotyczny*, wyd. I., Państwowy Instytut Wydawniczy, Warszawa 1972.
- [4] Edwards B., *Sustainable Architecture*, Architectural Design 04/2001, Architectural Design, London 2001.
- [5] Hosey L., *Kształt zieleni: estetyka, ekologia i design*, Island Press. Wersja Kindle.
- [6] Kalitko K., *Architektura: między materialnością i wirtualnością*, Wydawnictwo Naukowe UAM, Poznań 2005.
- [7] Mikoś-Rytel W., *O zrównoważonej architekturze ekologicznej i zarysie jej teorii*, Wydawnictwo Politechniki Śląskiej, Gliwice 2004.
- [8] Niezabitowska E., Masły D., Komar B., *Oceny jakości środowiska zbudowanego i ich znaczenie dla rozwoju koncepcji budynku zrównoważonego* : praca zbiorowa. Gliwice: Wydawnictwo Politechniki Śląskiej, 2007.
- [9] Pearce A., Yong Han Ahn and HanmiGlobal, *Sustainable Buildings and Infrastructure: Paths to the Future*, NY: Routledge, London-New York 2012.
- [10] Smith, Thomas Gordon. *Vitruvius on Architecture*, Monacelli Press, Nowy Jork 2003.
- [11] Tatarkiewicz W., *O filozofii i sztuce*, Państwowe Wydawnictwo Naukowe, Warszawa 1986.
- [12] Trzeciak P., *Historia, psychika, architektura*, Państwowy Instytut Wydawniczy, Warszawa 1988.
- [13] Weitz M., *The Role of Theory in Aesthetics*, The Journal of Aesthetics and Art Criticism, 15/1956, [online] p. 27–35, [access: 02.04.2012], [in.]: [prettydeep.files.wordpress.com/2013/01/weitzroleoftheory.pdf](http://prettydeep.files.wordpress.com/2013/01/weitzroleoftheory.pdf).
- [14] Vitruvius Pollio, Marcus, *O architekturze ksiąg dziesięć*, Prószyński i S-ka, Warszawa 1999.
- [15] Zielonko-Jung K., Marchwiński J., *Łączenie zaawansowanych i tradycyjnych technologii w architekturze proekologicznej*, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2012.