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The Impact of Avant-Garde Art on Brutalist Architecture

Wojciech Niebrzydowski

Faculty of Architecture, Białystok University of Technology, ul. Oskara Sosnowskiego 11, 15-893 Białystok, Poland; w.niebrzydowski@pb.edu.pl

Abstract: Brutalism was an architectural trend that emerged after World War II, and in the 1960s and 1970s, it spread throughout the world. The development of brutalist architecture was greatly influenced by post-war avant-garde art. The greatest impact on brutalism was exerted by such avant-garde trends as art autre, art brut, and musique concrète. Architects were most inspired by the works of such artists as Jackson Pollock, Jean Dubuffet, Pierre Schaeffer, Eduardo Paolozzi, and Nigel Henderson. The main aim of the research was to identify and characterize the most important ideas and principles common to avant-garde art and brutalist architecture. Due to the nature of the research problem and its complexity, the method of historical interpretative studies was used. The following research techniques were employed: analysis of the literature, comparative analysis, multiple case studies, descriptive analysis, and studies of buildings in situ. The research found the most important common ideas guiding brutalist architects and avant-garde artists: rejection of previous principles and doctrines; searching for the rudiments; mirroring the realities of everyday life; glorification of ordinariness; sincerity of the material, structure, and function; use of raw materials and rough textures.

Keywords: art; construction engineering; cubature architecture; design method; design paradigms; brutalist architecture

Citation: Niebrzydowski, W. The Impact of Avant-Garde Art on Brutalist Architecture. *Buildings* **2021**, *11*, 290. https://doi.org/10.3390/buildings11070290

Academic Editors: Oleg Kapliński, Agata Bonenberg, Wojciech Bonenberg and Marco Lucchini

Received: 10 June 2021
Accepted: 2 July 2021
Published: 4 July 2021

1. Introduction

It is hard to imagine greater integration of art and engineering than in brutalist architecture, especially in its beginnings. This connection did not only concern the architectural space, into which works of art (paintings, sculptures, tapestries) were introduced, nor only buildings decorated with ornaments, reliefs, and mosaics. Brutalists brought architecture into an existential relationship with art that went far beyond the mere function of beautification. In brutalism, integration between architecture and art took place at the most basic level. It was the level of rudimentary ideas, common foundations, the most deeply rooted principles and values from which architecture and art grew. These ideas also concerned strictly engineering issues, such as construction, materials, technical elements, and installations. Artist and architects considered their meaning, aesthetics, and ways of designing and exposing.

Brutalism was the architectural style that spread throughout the world after World War II. It reached the culminating point in the 1960s and faded away at the beginning of the 1980s. The architects who contributed most to the development of brutalism were Alison Smithson, Peter Smithson and Le Corbusier. They all collaborated with artists but also created art themselves. Knowledge of brutalist architecture is not sufficiently deepened. While the most famous works of the most eminent architects have been analyzed many times, the issues related to the theory of this style require further research. In particular, the relationship between brutalism and the ideas of avant-garde art should be explained.

When reviewing the state of the research field, significant publications and their authors should be identified. In this context, it should be stated that the most important researcher of brutalist architecture was Reyner Banham. He was at the same time a promoter, and even a co-creator, of the New Brutalism doctrine. Two of Banham's publications

are of fundamental importance—the article "The New Brutalism", which appeared in December 1955 in "The Architectural Review" [1] and the book "The New Brutalism: Ethic or Aesthetic?" [2], which was published 11 years later. The analyses contained in the article concerned the beginnings of brutalism and included, among others, its definition. The book was largely their continuation and extension. Despite the passage of time, it is to this day the most important study on both brutalist architecture and the doctrine of New Brutalism. In the short chapter "Brute, non and other art", Banham mentioned the influence of avant-garde art on brutalism [2] (pp. 61–67). He also presented the issues of cooperation between architects and artists in articles about two significant exhibitions: "Parallel of Life and Art" [3] and "This is Tomorrow" [4].

Tight relationships between brutalist architects and representatives of various arts took place within the Independent Group. The literature on the work of this group is quite rich. The publications of Anne Massey, including the book "The Independent Group: Modernism and Mass Culture in Britain, 1945–1959" from 1995 [5], as well as a monograph edited by David Robbins, "The Independent Group: Postwar Britain and the Aesthetics of Plenty" from 1990 [6], should be mentioned here. An important publication is also the book "As Found: The Discovery of the Ordinary" by Claude Lichtenstein and Thomas Schregenberger, which was published in 2001 [7]. The authors presented the idea of As Found, which is essential to both brutalist architecture and avant-garde painting, sculpture, photography, and film.

In research on brutalism, the publications of its precursors are important. Alison and Peter Smithson were involved in intensive publishing work [8–11]. In the 1953 article "House in Soho", they used the term "New Brutalism" for the first time [12]. Significant publications on the brutalist phase of Le Corbusier's work were books from the "Oeuvre complete" series, especially volumes 5, 6 and 7 [13–15]. The achievements and ideas of other important architects related to brutalism are presented in monographs. Books about the following architects helped obtain research material: Denys Lasdun [16], James Stirling and James Gowan [17], Ernő Goldfinger [18], Louis I. Kahn [19], Josep Lluís Sert [20], Paul Rudolph [21], John M. Johansen [22], Kenzo Tange [23], Kunio Maekawa [24], Gottfried Böhm [25], Sigurd Lewerentz [26], Vilanova Artigas [27], Lina Bo Bardi [28], and Balkrishna Doshi [29].

The works and ideas of avant-garde artists are also presented in individual monographs or articles. These include books about two of the artists most connected with the New Brutalism doctrine, Nigel Henderson [30] and Eduardo Paolozzi [31]. The authors of articles relating to the influence of individual artists on brutalist architecture are Ben Highmore [32,33], Hadas A. Steiner [34,35], Alex Kitnick [36], and Dirk van den Heuvel [37].

The analysis of the current state of the research field has shown that so far, only fragmentary research has been carried out on selected issues, artists, and architects. There is a lack of studies dealing with the issue of the influence of ideas of avant-garde art on brutalist architecture in a holistic manner. The most important artistic ideas in this respect should be identified, characterized, and systematized. The research should also go beyond the theory aspect and include practice: architectural forms, building structure, architectural elements and details, and textures. It should be shown that architectural solutions show similarity, or even identity, with artistic and architectural ideas. Therefore, this article will present the fundamental ideas and assumptions of avant-garde trends in the art of the post-World War II period. It will be proved that the precursors of brutalist architecture not only adopted these ideas but also co-created them. Artists used the common creative principles in their works of art, music, and literature, and architects used them in their architectural doctrines and buildings.

This ideological connection between certain trends in art and brutalist architecture is evident, especially in the formation of brutalism, i.e., in the 1950s and early 1960s. A special place here is occupied by the theoretical activity of British architects of the young generation, which is led by the Smithsons. They developed the architectural doctrine of

New Brutalism, which left a deep mark on brutalist architecture. Another precursor of the brutalist style in architecture was Le Corbusier. His work and concepts were particularly analyzed in the study.

Summarizing this introduction, the basic hypothesis should be emphasized. Post-war avant-garde art and brutalist architecture shared common ideas. These ideas and assumptions influenced the spatial, aesthetic, construction, and engineering solutions characteristic of brutalist buildings.

The main purpose of the research was to identify and characterize the most important ideas and principles common to avant-garde art and brutalist architecture. The practical impact of these ideas on buildings was presented in terms of their forms, structures, functional and spatial solutions, aesthetic effects, elements, and details.

2. Materials and Methods

The subject of research was both brutalist architecture and avant-garde art. The term "brutalist architecture" should be understood as a global architectural style of the second half of the 20th century. This term is much broader than "New Brutalism", which was the architectural doctrine of young British architects. The term "avant-garde art" covers such post-war trends as art brut, art autre, and musique concrète, as well as the works of artists connected with these trends. The scope of the research problem included both the theory and practice of brutalist architecture and avant-garde art. The research period covered the years 1945–1980, although some aspects went back to the interwar period. The most focus was on the first phase of brutalism, which is the 1950s and early 1960s. As brutalist architecture spread around the world, the research concerned architects and buildings from many countries. Nevertheless, it should be noted that the origins of brutalism are largely related to the United Kingdom, and therefore, much of the research is devoted to this country.

The specificity of the science of history and theory of architecture requires extensive analyses of objects as complex as buildings and issues as multi-faceted as architectural ideas. In the case of brutalism, creative ideas were particularly diverse and included inter alia, artistic, social, technical, and economic factors. Due to the nature of the research problems and their complexity, the general method of historical and interpretative research was applied. The following research techniques were employed: analysis of the literature, comparative analysis, multiple case studies, logical interpretation, descriptive analysis, study of the buildings on the site.

The course of research can be divided into four basic stages:

1. Collecting research materials.

Books and scientific articles, as well as information from internet sources, were collected. Photographs and design drawings from publications and obtained from other authors were also collected. During the study visits, our own photo and film documentation of the buildings was prepared. On-site research was carried out, inter alia, in the United Kingdom, France, Germany, Austria, Lithuania, Slovakia, Poland, Turkey, and the USA.

2. Identification and organization of materials.

The collected materials were initially organized according to several criteria in thematic groups concerning, among others: avant-garde trends in art, the doctrine of New Brutalism, works and ideas of individual architects, and forms of brutalist buildings.

3. Assessment and analysis of the collected materials and their interpretation.

The collected materials were assessed in terms of their usefulness in research. Further research was carried out based on the most significant materials, using the remaining ones as needed. The main research technique at this stage of research was the analysis of the literature supported by comparative studies. The subjects of comparative analyses were, among others, ideas and principles of artists and architects, works of avant-garde art and buildings, and specific features of works of art and works of architecture (e.g., textures).

In the course of these analyses and interpretations of their results, the main ideas common to avant-garde art and brutalist architecture were identified.

4. Formulation of results and conclusions.

The final stage involved the formulation of results and detailed conclusions regarding the individual ideas and principles. The author also compared the results with his own research goal and working hypothesis.

3. Results

The most important ideas and creative principles common to the studied areas of avant-garde art and brutalist architecture are listed and characterized below. Tables 1–7 show examples of buildings representative of each idea.

Table 1. Examples of buildings representative of the idea of rejection of previous principles and doctrines.

Building	Architect	Year
Sugden House in Watford	Alison and Peter Smithson	1955–1956
Richards Medical Research Laboratories in Philadelphia	Louis I. Kahn	1957–1961
Bank of London in Buenos Aires	Clorindo Testa	1960–1966
Southbank Arts Center in London	Norman Engleback	1964–1968
Goddard Library at Clark University in Worcester	John Johansen	1966–1969

Table 2. Examples of buildings representative of the idea of searching for the basics.

Building	Architect	Year
Patio and Pavilion (installation)	Alison and Peter Smithson	1956
Maison du Brésil in Paris	Le Corbusier	1957
Kagawa Prefectural Offices in Takamatsu	Kenzo Tange	1955–1958
Kokusai Kaikan Building in Kyoto	Sachio Otani	1963–1966
Center for Environment and Planning Technology in Ahmedabad	Balkrishna Doshi	1968–1972

Table 3. Examples of buildings representative of the idea of reflecting the realities of life.

Building	Architect	Year
Golden Lane Housing Estate in London (project)	Alison and Peter Smithson	1952
Keeling House in London	Denys Lasdun	1957–1958
Halen Estate near Berne	Atelier 5	1957–1961
Park Hill Housing Estate in Sheffield	J. Lewis Womersley, Jack Lynn, Ivor Smith	1957–1961
Metteotti Estate in Terni	Giancarlo de Carlo	1969–1974

3.1. Rejection of Previous Principles and Doctrines

New art and new architecture were supposed to break with the existing rules as inconsistent with the post-war realities. Avant-garde trends, especially musique concrète and *art autre*, showed how radical this rejection can be.

Table 4. Examples of buildings representative of the idea of glorification of ordinariness.

Building	Architect	Year
House in Soho in London (project)	Alison and Peter Smithson	1949–1954
Maisons Jaoul in Paris	Le Corbusier	1953–1955
Langham House Close in London	James Stirling, James Gowan	1957–1958
Florist Kiosk in Malmö	Sigurd Lewerentz	1969
Casa Martirani in São Paulo, 1969–1974	Vilanova Artigas	1969–1974

Table 5. Examples of buildings representative of the idea of sincerity.

Building	Architect	Year
Secondary School at Hunstanton	Alison and Peter Smithson	1949–1954
Istituto Marchiondi in Milan	Vittoriano Viganò	1953–1957
Convent Sainte Marie de La Tourette in Éveux	Le Corbusier	1953–1961
Salk Institute for Biological Studies in La Jolla	Louis I. Kahn	1962–1965
Servico Social do Comercio in Pompeia	Lina Bo Bardi	1977–1982

Table 6. Examples of buildings representative of the idea of rough textures.

Building	Architect	Year
Unite d'Habitation in Marseille	Le Corbusier	1947–1952
Yale Art and Architecture Building in New Haven	Paul Rudolph	1958–1963
Sports and Recreation Center in Zürich	Hans Litz, Fritz Schwartz	1961–1965
Elephant and Rhinoceros Pavilion at London Zoo	Hugh Casson, Neville Conder	1961–1965
Sampson House in London	Fitzroy Robinson, and Partners	1976–1979

Table 7. Examples of buildings representative of the idea of As Found.

Building	Architect	Year
Upper Lawn Pavilion in Fonthill Abbey	Alison and Peter Smithson	1959–1961
Hotel Godesberg in Bad Godesberg on the Rhine	Gottfried Böhm	1961
METU Faculty of Architecture Building in Ankara	Altug and Behruz Cinici	1961–1963
City Hall in Boston	Gerhard Kallmann, Michael McKinnell	1963–1968
Boston Government Service Center	Paul Rudolph	1966–1971

The architecture that Banham referred to as architecture autre (other architecture) was also supposed to bring about such fundamental changes. The New Brutalism doctrine seemed to be the beginning of such architecture of another kind. This was confirmed by the first projects of the Smithsons and the buildings of other British architects. In place of devalued rules, brutalist architects introduced new ones: subordinating the form of a building to the circulation of people and their perception, articulation of internal functions in the form, sincerity of structural expression, strong contrasts, vehement juxtapositions of solids, and repetitive and disturbed rhythms. New ordering and unconventional forms of buildings were often incomprehensible to an ordinary user (Table 1).

3.2. Searching for the Basics

Avant-garde artists sought rudiments in the work of artistically uneducated people or primitive tribes. They created paintings and sculptures by drawing on their own basic emotions, which were expressed in a spontaneous, direct way.

In brutalist architecture, referring to rudiments was connected both with the simplification of forms and the use of local and natural materials, as well as inspiration with the works of uneducated creators of vernacular architecture, but most of all with reaching the most basic ideas and principles of architecture. The architects tried to reject stereotypes and established patterns in order to objectively assess the context. They had to start each design task from scratch. Inspiration by vernacular architecture led to a regional diversification of brutalism. The most relevant example of reinterpreting the solutions of the local architectural tradition was Japanese brutalism (Table 2).

3.3. Reflecting the Realities of Life

Avant-garde painters, sculptors, and composers saw their art as a manifestation of life, even its dark sides. Photographers photographed the everyday life of working-class districts and rural settlements to reflect the relationships between people, space, and time.

Brutalist architects were fascinated by vernacular architecture precisely because it was a direct response to the real needs and situation of users. The aspirations to link life and brutalist architecture were most fully expressed in the design of residential buildings and housing estates. The architects paid special attention to the spaces of social contacts. The most important solution in this respect was the street deck, which was a reinterpretation of the street in a traditional housing estate. Other spaces for establishing neighborly relations were galleries, courtyards, terraces, bridges between buildings, rues intérieures, and drying rooms (Table 3).

3.4. Glorification of Ordinariness

The connection of art and architecture with everyday life led to the fascination with ordinariness. The artists presented images of everyday objects in their works or used them directly, as found. They also employed prosaic, unattractive materials such as sand, asphalt, mud, and rubbish.

Brutalist architects acted similarly, using ordinary, readily available materials and extracting their artistic value. Among them were brick, stone, wood, sheet metal, and common plywood. However, the most popular was concrete, which offered enormous structural and aesthetic possibilities. The details, elements, and architectural forms were also simple and sometimes even primitive. However, in the later phase of brutalism, the ordinary was largely replaced by the extraordinary (Table 4).

3.5. Sincerity of Artwork and Building

Sincerity was an inherent feature of art autre and art brut. It manifested itself in the honest expression of the artist's emotions and the expression of the physical properties of the materials he used. The relationship between the material and the work of art was clear and unbreakable.

The results of the idea of sincerity and directness in brutalist architecture were use of raw materials, rejection of the aestheticization of the building's surfaces and any imitations, exposing the overall constructional system of a building and its individual elements, mirroring methods and stages of erecting a building in its form and surfaces, articulation of internal functions, and exposing and highlighting technical elements (Table 5).

3.6. Roughness of Textures

The works of avant-garde artists drew the attention of brutalist architects to the qualities of rough surfaces, bearing traces of the way they were made. Dubuffet claimed that the essential gesture of a painter is to smear, not to smooth. Paolozzi's bronze sculptures had an uneven texture composed of small objects.

Brutalist buildings usually had rough surfaces because the textures were supposed to be sensual. The uneven and heterogeneous surfaces were picturesque, and they produced variable visual effects depending on the distance and lighting. The architects did not strive for perfectionism but preferred ordinary building craftsmanship. Craft methods gave their works additional value of originality and uniqueness. In some brutalist buildings, defects of surfaces were not hidden but even emphasized, which can be described as the poetics of "magnificent ruins" (Table 6).

3.7. The Idea of as Found

The use of found objects was the essence of the work of many avant-garde artists. In the post-war years, these were often things found in the ruins of destroyed cities and later everyday objects, parts of mechanisms, and things of nature.

Influenced by artists, brutalist architects treated building materials as found objects. Sometimes, they also used real found objects in their buildings. It should be emphasized that the broad idea of As Found and the resulting design method became particularly important for brutalism. As Found contributed to an objective analysis of the context, searching for specific features of a place, and taking into account the conditions. The uniqueness of brutalist buildings resulted from the fact that architects treated the existing situation as a found object (Table 7).

Figure 1 presents the intensity of each idea in brutalist architecture (from 1950 to1980) (Figure 1). Research shows that the intensity of all ideas declined in the following decades, reaching the lowest levels in the final phase of brutalism. Only the idea of sincerity and, to a lesser extent, the idea of roughness remained of great importance throughout the duration of the style.

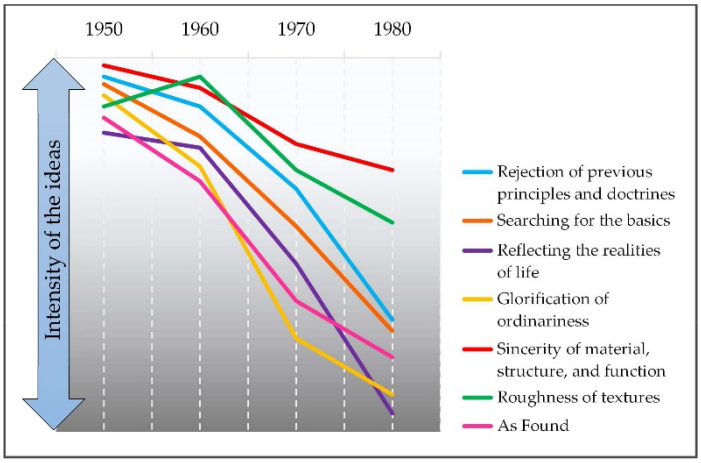

Figure 1. The intensity of the ideas in brutalist architecture (author: Wojciech Niebrzydowski).

Figure 2 presents the impact of the ideas on architectural solutions, forms, and aesthetic effects (Figure 2). The research shows that the idea of sincerity contributed the most to the development of the indicated attributes of brutalism. The other ideas were of similar importance in this respect.

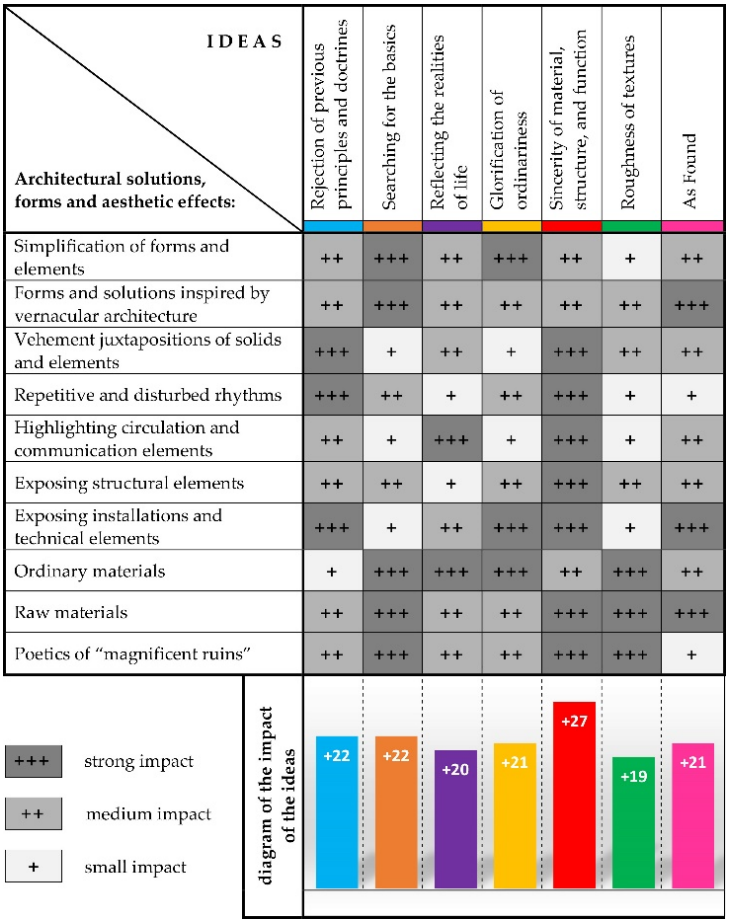

Figure 2. The impact of the ideas on architectural solutions, forms, and aesthetic effects (author: Wojciech Niebrzydowski).

4. Discussion

4.1. Artistic and Architectural Avant Garde after World War II

After World War II, a new political, economic, and social situation emerged in many countries. The war also had a great impact on art and culture. However, new artistic trends did not develop as dynamically as after World War I, when dadaism, surrealism, and purism emerged. Stagnation was also visible in architecture. At that time, such innovative architectural trends as those created thirty years earlier—modernism, expressionism, constructivism—were not developed. After World War II, modernism gained the greatest importance, but from the avant-garde trend, it turned into popular "soft modernism". In many countries, attempts were also made to use the threads of traditional architecture, albeit in a superficial way (e.g., New Humanism). In countries subordinate to the Soviet Union, socialist realism was introduced as the obligatory style. In fact, the primary task of architects everywhere was to rebuild cities and provide housing, not to search for new styles.

An example of a country stricken by the war, despite being victorious, was the United Kingdom. Many cities were destroyed, food was rationed, and the public mood was pessimistic and stagnant. British artists of the young generation were some of the first to wake up to this apathy. Some of them formed the Independent Group in 1952, which was extremely important for the beginnings of brutalism. The Independent Group gathered artists, writers, designers, and architects [5] (pp. 2–3) who met at London's Institute of Contemporary Art [38] (p. 6). It is worth noting that they also had similar political views, and most of them were socialists. The tragic events of the war left an imprint on both their psyche and creativity. The family of the painter Magda Cordell died at the hands

of the Nazis. Nigel Henderson was dismissed from the Royal Air Force due to a nervous breakdown [7] (p. 92). The Italian family of Eduardo Paolozzi had lived in Edinburgh for years. When Italy declared war on Britain, they were arrested and deported to Canada on the SS Ambrosia ship, which was torpedoed and sunk [32] (p. 101). The radical and nonconformist stance of these young artists pushed art, literature, and theatre in the United Kingdom to new paths. At the root of these changes was the idea of searching for art that would correspond to the harsh post-war reality and situation of British society. William J.R. Curtis emphasized that they were involved "in trying to convey the rough grain of modern urban life in a new art" [39] (p. 530). They also drew inspiration from new trends in world art and works of other avant-garde artists.

Among the members of the Independent Group were also architects: Alison and Peter Smithson, James Stirling, and Colin St John Wilson. These young architects set themselves the goal of creating new, up-to-date architecture. Historian and critic Reyner Banham actively assisted in their efforts. They were disappointed with the trends prevailing in British and world architecture after World War II. They found these trends false and incompatible with the times and felt that "the majority of architects have lost contact with reality and are building yesterday's dreams when the rest of us have woken up in today" [8] (p. 185). The Smithsons in particular played an important role in the development of brutalist architecture. They called their architectural doctrine New Brutalism, which was a reference to the term "Nybrutalism" used by Hans Asplund in 1950 to describe Villa Göth in Uppsala ([2] p. 10). They based it on several general ideas, including the objective perception of reality and the direct relationship between architecture and life. Moreover, architecture should evoke emotions, just as works of avant-garde art do. The Smithsons wanted the language of architecture to be moving, not just pleasant [7] (p. 125). They believed that thanks to this, architecture would help society recover from the war trauma and regain a sense of identity.

Architects searching for a style appropriate to the post-war era reached for ideas and principles on which the avant-garde trends in art were based. This was due to the fact that they did not find them in the pseudo-traditional architectural trends, the sentimental International Style, and the post-war buildings of the old masters of modernism. Instead, they had special relationship with art autre, art brut, action painting, pop art, musique concrete, and the works of Jean Dubuffet, Jackson Pollock, Pierre Schaeffer, Eduardo Paolozzi, and Nigel Henderson.

In 1952, the French art critic and curator Michel Tapié published the book *Un art autre* [40], in which he postulated that post-war art should correspond to the turbulent nature of that time and completely reject the old styles. As examples of art autre, he gave, among others, works of Pollock, Dubuffet, and Paolozzi, as well as such "anti-artists" as Jean Fautrier and Georges Mathieu [2] (p. 61). The works of art autre were characterized by expressiveness and anti-formalism. The spontaneously created works were a radical break with traditional notions of composition and order.

Art brut is a term coined by Jean Dubuffet. He defined it as art created by people without artistic education. The works of art brut showed the creative power inherent in every human being, which over time is suppressed by social norms or the educational system [41] (p. 34). Dubuffet gave examples of pictures painted by children and mentally ill people. However, art brut was also practiced by professional artists, such as Magda Cordell from the Independent Group "with the impressively violent style of painting in her Monoprints" [7] (p. 157).

Another artist, this time from the USA, who left his mark on brutalism was Jackson Pollock. Ben Highmore even argues that Pollock contributed more than anyone else to the formation of the New Brutalism doctrine [33] (p. 277). His action painting, the technique of spontaneous splashing liquid paint on canvas, fascinated young architects with its expressive effects and the rejection of compositional rules. According to Banham, Pollock became for them "a sort of patron saint of anti-art even before his sensational and much published death" [2] (p. 61).

Pierre Schaeffer composed experimental music in which he used random human voices or sounds recorded in the streets or factories [37]. The musical trend he initiated was described as musique concrète. It broke the classical rules of music in a way that was as radical as art autre broke the classical rules of painting and sculpture.

The Smithsons' closest associates in the Independent Group were not other architects, but two artists, Eduardo Paolozzi and Nigel Henderson. As members of one team, they created two exhibitions fundamental to the New Brutalism: "Parallel of Life and Art" (1953) and installation "Patio and Pavilion" (presented at the exhibition "This is Tomorrow", 1956).

Paolozzi's work was accompanied by aspects related to the most important ideas of the New Brutalism: As Found, image, and sincerity of the material. In the 1940s, Paolozzi made collages from newspaper clippings, and after returning from Paris to England in 1951, he focused on sculpture. He used ordinary materials, including cast concrete, which is so important for brutalist architecture.

After the war, trying to recover from his nervous breakdown, Henderson turned to photography. The artist experimented with variable exposure times, deformations, and blurring of human figures. Kenneth Frampton claims that Henderson's work "evokes at one stroke time, place, decay, and movement" [42] (p. 49). It should be emphasized that all these aspects, especially the movement and circulation of people, became the key problems of brutalist architecture. Henderson's photographs were used by the Smithsons to prepare the exhibition presented in 1953 at the CIAM (International Congress of Modern Architecture) meeting. In this way, they gained fame and became symbols of new thinking about architecture and urban planning.

It cannot be ignored that young architects also drew inspiration from the architecture itself. Early in their career, the Smithsons referred to Mies van der Rohe, Hugo Häring, and even Andrea Palladio. However, the real impact on their doctrine had one architect—Le Corbusier. He gained great respect in their eyes because he was able to make a radical turn in his work. Despite his status and widespread recognition for his earlier works, he did not follow the mainstream of post-war architecture, as most pre-war masters did. Similar to young architects, he wanted to create a new style that truly corresponded to reality [43].

Already in the 1930s, Le Corbusier's works showed signs of rejecting machine aesthetics in favor of more diverse textures and stronger articulation of solids in an architectural form. He decided to create more sensual and expressive architecture in which emotional experience plays a leading role. Le Corbusier was inspired by vernacular architecture, which he considered sincere and directly corresponding to the everyday life [44]. Finally, he began to implement his architectural credo, which was expressed already in 1923: "L'Architecture, c'est, avec des matières brutes établir des rapports émouvants" ("Architecture is, with raw materials, establishing moving connections") [45] (p. 4). As a result of this turn, he designed his first proto-brutalist buildings. They foreshadowed his new style and, at the same time, a style that appealed to so many other architects in the 1950s, not only the younger generation [46] (pp. 14–15). The following houses should be mentioned here: Maison de Mme de Mandrot in Le Pradet (1931), the holiday house Le Sextant in Les Mathes (1935), and Petite Maison de Week-end in Boulogne-sur-Seine (1935). Henry-Russell Hitchcock wrote that they all showed respect for local materials and simple country craftsmanship [47] (p. 518).

4.2. Rejection of Outdated Rules and Canons

World War II changed the world so much that progressive architects decided that architecture should also be radically different from the previous one. It should become an expression of a society in change [48]. The Smithsons were among the first to start working on a new architectural doctrine. The New Brutalism was to be based not on stylistic but ethical assumptions, such as truth, objectivity, sincerity, and directness. These features were also present in the avant-garde artistic trends of the time. Objectivity to the new reality required rejecting the previous rules and "to overthrow the classical tradition" [2] (p. 62). Young architects, together with artists, were involved in the anti-art movement.

4.2.1. Art Autre and Architecture Autre

Architects admired how avant-garde artists break the traditional principles of art—painting, sculpture, and music. The works of artists from the interwar period convinced them that the new order was possible. Among them was Paul Klee, for whom the form was the result of growth and change [49] (p. 77).

Dubuffet not only collected art brut works but also created such paintings himself. Primitivized, caricatured, made with the use of unconventional techniques giving a rough texture, they completely departed from the recognized canons of art. They seemed to emanate the ugliness, deformation, and randomness of the composition. Paolozzi, despite studying in many art schools, decided to reject academic art. His main idea and goal were to reflect the harsh living conditions without any compromises or embellishment. Schaeffer discovered previously disregarded sounds, including sounds of the city. He used their musical potential to create innovative musique concrète in which he abandoned the traditional kind of harmony, melody, and scale. He also manipulated the recorded sounds, distorting them in various ways.

However, the works of Jackson Pollock played the greatest role in the rejection of classical principles in brutalist architecture. Europeans first saw his spatter paintings at the Biennale di Venezia in 1950. British architects became acquainted with Pollock's works 3 years later at the exhibition "Opposing Forces" in the Institute of Contemporary Art in London. Banham wrote about them: "The impact of these pictures on the intellectual edifice which architects had built around classical theories of measure and proportion was to be extremely destructive" [2] (p. 61). The Smithsons, on the other hand, noticed in spatter paintings a revolutionary approach to artistic creativity and a new order in art [10] (p. 86). Jackson Pollock practiced action painting, radically subverting formalistic artistic conventions. This type of painting was primarily a notation of the creative process. It was also connected with the all-over principle, which involved painting in such a way that every fragment of the picture became important and expressive. Similar effects were followed by many brutalist buildings in which all elements were expressive and visually strong. An example is Boston City Hall (1963–1968). During its design, Gerhard Kallmann used his concept of "action architecture", which drew inspiration from Pollock's action painting and its critical reception [50] (p. 56).

Le Corbusier was also fascinated with action painting. Together with Tino Nivola, he developed a specific sculptural method called "action sculpture", which gives interesting textural effects. During his stay in the USA in the early 1950s, Le Corbusier lived by the ocean on Long Island. He and Nivola waited for the ebb of the ocean; then, they formed wet sand and poured plaster (gypsum) over it. Plaster sculptures made in this way were raw, their shape resulted from the possibility of forming sand—the material in which they were cast. At the same time, they had a rough texture reflecting the structure of sand. Similar features characterize Le Corbusier's brutalist buildings and their concrete surfaces with an imprint of the formwork material.

The concept of architecture based on completely new principles was promoted by Banham. He was searching for an architecture of another kind—une architecture autre (other architecture). This name was not accidental because "the term was coined by analogy with Tapie's concept of un art autre and was intended to stand for something equally radical" [2] (p. 68). Architecture autre ought to be as vehement and extremely expressive as the works of Dubuffet, as distant from the routines of classical composition as Pollock's paintings. It should also be based on "materials as found", as musique concrète is based on "sounds as recorded". Banham even predicted that in the future, it ought to abandon the idea that the most important role of an architect is to use structure to make space. He hoped that the New Brutalism would be such other architecture, or at least its seed. He appreciated the cooperation of architects and avant-garde artists. As a member of the Independent Group, Banham participated in meetings with artists from various countries. He was particularly moved by the meeting with Schaeffer in 1953 and wrote that musique concrète "gave a measure of the extent to which une architecture autre could

be expected to abandon the concepts of composition, symmetry, order, module, proportion, 'literacy in plan, construction and appearance', in the sense accepted in the theory of architecture as taught in the Ecoles des Beaux-Arts, and piously preserved in the Modern Architecture of the International Style and its post-war successors" [2] (p. 68). Rhythms were the primary tool of music composers. Similarly, in the case of brutalist architects, rhythms—repeated or interrupted in unexpected ways, simple or complex—became the leitmotif of many buildings.

4.2.2. Breaking the Rules—The Smithsons and British Architects

Before the Smithsons began to make Banham's dreams of architecture autre a reality, they prepared two groundbreaking exhibitions, both in collaboration with Paolozzi and Henderson. The first, "Parallel of Life and Art" (1953), had a significant subtitle "Indications of a New Visual Order". The unconventional way of arranging panels with 122 photographs in space was one of the most important aspects of this exhibition. Each of the panels was an autonomous exhibit placed in a seemingly random manner in space. The panels differed in size and location, yet their arrangement gave the impression of a specific coherence. It was impossible to focus on just one image because the view of another was superimposed on it. In this way, the images lost their status as separate elements and established relationships with each other. The authors of the exhibition wrote in the catalogue: "In short it forms a poetic–lyrical order where images create a series of cross relationships" [51]. These relations were varied and depended on the visual similarity of the objects presented in the photos. Henderson, emphasizing the aspect of the interaction of the plates, compared the way of their installation to a cobweb that formed something similar to a nervous system [36] (p. 73). The arrangement of the plates made the observer move from place to place, positioning himself at the correct angle to individual images. The reduced resolution meant that to see the picture accurately, the observer had to move away from it or get closer to it. The exhibition "Parallel of Life and Art" was not only a milestone showing how new architectural order can follow new visual order. It also raised issues that will become key problems for brutalist architects: circulation of people, perception of architecture in motion, discovering spatial relationships and unconventional ordering rules, affirmation of ordinariness.

The installation "Patio and Pavilion" (1956) referred more directly to architecture, and as the name of the entire exhibition "This is Tomorrow" indicated, it referred to the future of architecture. The authors of the installation, using a rather enigmatic building, symbolic objects, and the limitation of space, created a virtually formless place with meaning understandable to people. It should be remembered that according to Banham, "formless buildings" were supposed to be the essence of architecture autre [2] (p. 68).

The idea of rejecting the previous compositional principles in architecture was implemented by the Smithsons in 1956 in Sugden House in Watford (Figure 3). This building was also a reaction to the white, abstract box-like houses of the International Style [38] (pp. 11–12). The Smithsons explained the concept of Sugden House: "From individual buildings, disciplined on the whole by classical aesthetic techniques, we moved on to an examination of the 'whole' problem of human associations and the relationship that building and community have to them. From this study has grown a completely new attitude and non-classical aesthetic" [9]. However, architecture critics were appalled by the building, especially the chaotic arrangement of its various windows. They condemned architectural illiteracy in plan, construction, and appearance [2] (p. 67). The Smithsons (and Banham) were actually satisfied with such opinions, as these words confirmed that they had managed to employ a new kind of architectural grammar.

The New Brutalism had a strong influence on British brutalist architecture. It is no wonder then that in this country, the tendencies to reject the classical principles were visible throughout the style—not only in its initial phase but also in later years. The following examples from London confirm this thesis.

In the 1950s, these were public buildings designed by Lyons, Israel, and Ellis (e.g., the Old Vic Theatre Annexe, London, 1958) or residential buildings designed by Denys Lasdun (Sulkin House and Keeling House, London, 1958). It should be emphasized that Lasdun's cluster blocks went beyond aesthetic and compositional principles, but also beyond the traditional way of functioning of a residential building. In the 1960s, the Southbank Arts Center was built. It included Queen Elizabeth Hall and Hayward Gallery (Chalk, Herron and Crompton under the group leader Norman Engleback, London, 1968). According to critics, the complex was deliberately unresolved in compositional terms and was a demonstration of the brutalist concept of "crumble" [52] (p. 117). In fact, "the quirky topology" [53] was the result of subordinating the form of the building to the circulation of people and their perception (Figure 4). The complex should be interpreted in an unconventional way as a system of places and visual events located along alternative paths. An example from the 1970s, the last decade of brutalism in England, was the Sampson House (Fitzroy Robinson & Partners, London, 1976–1979). The huge building was a kind of brutalist megastructure (Figure 5). Its alien, vehement form, bizarre details, raw materials, and textures shocked even artistically sophisticated Londoners. Due to the lack of acceptance (but also for economic reasons), the building was demolished in 2018.

Figure 3. Alison Smithson and Peter Smithson, Sugden House in Watford, 1955–1956 (photo: Joshua Abbott).

Figure 4. Norman Engleback, Hayward Gallery in London, 1968 (photo: author of the article).

4.2.3. New Ordering in Brutalist Architecture

Another type of ordering and composition in brutalist architecture was the principle of articulation of internal functions in the form of a building. One of its precursors was Le Corbusier, who showed functions on the facades in Chandigarh using variable patterns of reinforced concrete loggias and brise soleils. It was also practiced by Louis I. Kahn, exposing served and servant spaces in Richards Medical Research Laboratories in Philadelphia (1957–1961) [19] (p. 124).

Figure 5. Fitzroy Robinson & Partners, Sampson House in London, 1976–1979 (photo: author of the article).

These concepts were consistently developed by Josep Lluís Sert. His Law and Education Tower at Boston University (1960–1965) clearly reflects the idea of a "vertical city". It was a building that contains a multitude of functions, including urban functions, and articulates them in its form. The arrangement and mutual relations of the elements on the three-dimensional facade make it possible to read the meanings assumed by the architect, which would not be possible with a smooth facade. He applied similar solutions at the Holyoke Center in Cambridge near Boston (1960–1967). The articulation of the complex functions of the building is visible especially on its southern facade (Figure 6). Sert achieved a clear effect primarily through the varied rhythms of vertical reinforced concrete sun breakers, showing the location of hospital rooms, doctor's offices, seminar rooms, and the floor for patient recreation. Working on the integration of urban planning and architecture, Sert applied the principle of articulation of functions also in large building complexes and megastructures. Charles Jencks wrote about the Boston University Complex: "Sert breaks down a gigantic volume into several related forms and spaces which announce the differences in function. These differences are further articulated by using separate materials, and by making the construction apparent. All this rich articulation has the effect of explaining a diverse and possibly overwhelming complexity without falling into strident rhetoric or eroded symbolism" [54] (p. 115).

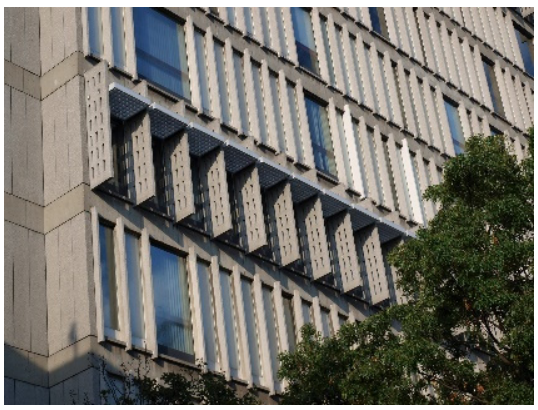

Figure 6. Josep Lluís Sert, Holyoke Center in Cambridge near Boston, 1960–1967 (photo: author of the article).

Other American buildings, such as Boston City Hall and Goddard Library at Clark University in Worcester designed by John Johansen (1966–1969), also articulated their functional structure in a very expressive way, using overhanging solids and different textures. The form of Goddard Library differs so far from conventional buildings that it evokes associations with a complicated machine that is only in the assembly phase. Johansen compared his work to a photocopier without a case and said that it was closer to a

three-dimensional bubble diagram than a conventional building [22] (p. 14). He described his design of Goddard Library "likening it to assembling the required spaces—lobby, stacks, offices, reading rooms, study carrels, circulation stairs, and elevator shafts—within a large plastic bag and then drawing out all the air to reveal the building's form" [55].

The principle of exposing functions gave spectacular results in the USA, but it was also evident in brutalist buildings in other countries. Examples are Hotel Tokoen in Yonago (Japan, 1963–1964) by Kiyonori Kikutake and Caja Costarricense de Seguro Social in San Jose (Costa Rica, 1977–1979) by Alberto Linner. In Poland, brutalism was especially visible in religious architecture. In the forms of churches, various liturgical functions were articulated. An example is the Church of St. Jan Kanty in Poznań (1976–1980) designed by Jan Węcławski in which the rhythm of cantilevered solid housing confessionals was articulated (Figure 7).

Figure 7. Jan Węcławski, Church of St. Jan Kanty in Poznań, 1976–1980 (photo: author of the article).

Brutalist architects also applied other individual rules of order and composition. The rejection of classical principles has made this architecture difficult to understand. It is commonly believed that brutalist buildings are inhuman and ugly [56]. However, it should be emphasized that the goal of brutalist architects has never been to glorify ugliness. On the other hand, they also did not pursue beauty. Actually, they did not pursue any other aesthetic attribute. The brutalist building was supposed to provoke the senses, not satisfy any taste.

However, it seems that several architects were close to the effects assumed by art autre artists. About his sculptures from the 1950s, Paolozzi said: "I was trying to make a kind of anti-art object; really trying to make something which looked horrible. It was a reflection on the sensibility of that time" [32] (p. 103). A similarly shocking aesthetic effect in architecture was achieved by Clorindo Testa and SEPRA Studio. In the Bank of London in Buenos Aires (1960–1966), they used strange shapes, deformed elements, and bombastic corner to break with the traditional image of a building (Figure 8). In turn, Lina Bo Bardi, in her provocative statement about her building, Servico Social do Comercio (SESC) in Pompeia (1977–1982), "declared that she wanted the SESC to be even uglier than the MASP [Museu de Arte de São Paulo—her earlier building]" [57] (p. 152).

4.3. In Search of Rudiments

Avant-garde artists rejected the existing values in art and looked for new ones instead. They found these values in the pure minds of uneducated artists. They also found them in the works of primitive peoples, which were the result of the basic, simplest emotions. They discovered true principles at the basis of human culture. Dubuffet appreciated the value of works created without influences, without a specific purpose, and therefore spontaneous and sincere. "Those works created from solitude and from pure and authentic creative impulses—where the worries of competition, acclaim and social promotion do not interfere—are, because of these very facts, more precious than the productions of profes-

sionals" [58]. Paolozzi's figurative sculptures from the post-war period were simplified, primitivized, almost similar to archaic artefacts. For example, Paolozzi explored how far he can simplify a sculpture of a head so that it is still perceived as a head. He asked himself: "How far can the disintegration of the head go without the head losing its identity" [59]?

Figure 8. Clorindo Testa and SEPRA Studio, Bank of London in Buenos Aires, 1960–1966 (photo: Bogusław Podhalański).

Architects, similar to artists, looked for the basics in the works of uneducated people, which were free from imposed stylistic rules. These people were the builders of vernacular architecture. Brutalist architects believed that there are objective, eternal, deep-rooted values in such architecture. Contemporary vernacular buildings became important because direct contact with them and their authors was still possible, unlike with architects from past historical epochs.

Le Corbusier observed that the abstract forms of modernist buildings did not appeal to the common people. He noticed that people identify rather with buildings with traditional forms made of local materials. Le Corbusier realized how great artistic and emotional potential lies in vernacular architecture and primitive houses of rural builders. During his vacation in the countryside, he began sketching rural cottages, fishermen's houses, and their details. He also took measurements of such buildings [44]. As a result of analyses of vernacular architecture, Le Corbusier discovered the value of raw, natural materials as well as traditional steep roofs, massive walls, and narrow windows. However, it should be emphasized that in the works of ordinary builders, he was looking not for primitivism but architectural wisdom [60] (p. 6). He was convinced that the concept of contemporary architecture could be influenced by the experience of ancient cultures, especially from their origins [61] (pp. 345–346). Inspired by vernacular architecture, Le Corbusier fully developed his brutalist style in the post-war period. Direct references to the forms of traditional buildings were hardly noticeable in his works. Although they are clearly visible in the use of raw and natural materials such as stone, e.g., in the Maison du Brésil in the Cité Universitaire built in Paris in 1957 (Figure 9).

Other brutalist architects, seeking the basics, drew more direct formal inspiration from vernacular architecture. They often combined motifs of local architecture with brutalist elements and forms. This was particularly evident in Japanese brutalism, where architects used both eternal ideas and reinterpreted forms and solutions specific to vernacular architecture. Relevant examples are buildings in which reinforced concrete structures imitated the system, proportions, and sometimes even shapes of wooden construction elements. In the Tsuyama Culture Center built in 1965 according to the project of Kohji Kawashima, all structural elements replicate the wooden poles, beams, and corbels used in Japanese temples. Less direct references to the tradition can be seen in the Kyoto Kokusai Kaikan Building built in 1963–1966 according to the project of Sachio Otani (Figure 10). The form of the building is characterized by complexity, monumentality, and sloping walls [62] (pp. 78–79). The pioneers of Japanese brutalism, such as Kenzo Tange and Kunio Maekawa,

also reached the roots of architecture. This is evidenced by buildings built in the 1950s: the Kagawa Prefectural Offices in Takamatsu (Tange, 1955–1958) and Harumi Apartment Building in Tokyo (Maekawa, 1957–1958). Frampton wrote about the first building that it was "a béton brut version of Daibutsu wooden style of the 12th century as we find this in the Todaiji precinct at Nara, which for Tange embodied the essence of Japanese national culture" [63] (p. 98).

Figure 9. Le Corbusier, Maison du Brésil in Paris, 1957 (photo: author of the article).

Figure 10. Sachio Otani, Kokusai Kaikan Building in Kyoto, 1963–1966 (photo: Stephen Smith).

Brutalism reached another Asian country, India, thanks to Le Corbusier. In the form of the Mill Owners' Association Building (1954), we can find references to the traditional wooden and stone architecture of the Gujarat Region [39] (p. 426). Frampton even suggested that the concrete roofs of the High Court in Chandigarh were a reinterpretation of roofs from Fatehpur Sikri—the capital of the Great Mughal [64] (p. 228). However, it should be emphasized that Indian native architects—Charles Correa, Balkrishna Doshi, and Achyut Kanvinde—really deepened the ties between brutalism and vernacular architecture. These include the Museum of Mahatma Gandhi in Ahmedabad (Correa, 1963) and the Center for Environment and Planning Technology in Ahmedabad (Doshi, 1968–1972), combining brick and concrete structures with local motifs [65]. In Turkey, Behruz and Altug Cinici referred to local architecture in the METU Faculty of Architecture Building in Ankara (1961–1963). The building has only two floors; its monochromatic form is fragmented and devoid of expressive elements, such as overhangs. These features were taken from the traditional architecture of Anatolia.

References to vernacular architecture are visible in Polish sacral architecture [66]. The steep, gable roof characteristic of rural residential and farm buildings was especially used. As the dominant element and in a very direct way, it was applied by Szczepan Baum in the Church of the Assumption of the Blessed Virgin Mary in Władysławowo (1958–1962) and Władysław Pieńkowski in the Church of the Blessed Virgin Mary, Mother of the Church in

Sulejówek (1972–1983). In addition to concrete, traditional materials such as red brick and field stones were used (Figure 11).

Figure 11. Władysław Pieńkowski, Church of the Blessed Virgin Mary, Mother of the Church in Sulejówek, 1972–1983 (photo: author of the article).

The proponents of the New Brutalism also drew from the vernacular architecture. In "Patio and Pavilion", they returned to the roots of architecture—a piece of the world (a yard) and an enclosed space (a house)—two necessities of human habitat. The Smithsons showed that these architectural rudiments will also be valid in the future [33] (p. 277). They emphasized this by using both traditional (wood) and modern materials (corrugated plastic, aluminum) in their installation. An appeal to fundamentals is visible in their analyses of social patterns of associations in primitive habitats. As a result of these studies, they concluded: "From pre-history to contemporary peasant society, each culture has thrown up a limited number of house forms. The culture expresses itself through these forms. Today's problem is to define that form unique to each culture group" [11] (p. 14). It is worth noting that Alison and Peter Smithson ended their program manifesto, published in January 1955, with a significant reference to the vernacular architecture: "What is new about the New Brutalism among Movements is that it finds its closest affinities, not in a past architectural style, but in peasant dwelling forms" [67]. They undoubtedly confirmed this idea in Sugden House. An important aspect of their searching for the basics was starting each design task from scratch. They always rejected all stereotypes, imposed patterns, and objectively assessed "realities of the situation" [2] (p. 87).

4.4. Art and Architecture as the Direct Result of a Way of Life

The linking of architecture with everyday life was one of the assumptions of brutalism. The vernacular architecture was also glorified because it was a direct response to the real needs of users. The connection of art brut and art autre with life, even its ugly and dark sides, also seems obvious. The Smithsons claimed: "Architecture, painting, and sculpture are manifestations of life, satisfying real needs; of man and not of each other" [68].

Henderson focused on life and "the everyday activities of people whose energies were mostly directed towards the basic needs of survival" [35] (p. 141). He was also inspired by the research of his wife Judith Stephen, who from 1945 conducted an anthropological project called "Discover Your Neighbour". Henderson's photographs, depicting the everyday life of Bethnal Green (where he lived) and other London districts, were not merely documentary photos. The artist analyzed human associations [49] (p. 105), relations between people and surroundings, and how these aspects change over time. Later, Henderson turned to X-ray and microscopic photographs which he treated as a metaphor of life. The artist had a great influence on the doctrine of New Brutalism. The existential nature of brutalist architecture was derived from Henderson and Paolozzi [64] (p. 263).

Just as Henderson photographed the everyday life of ordinary workers and their families in London, Pierre Jeanneret and Charlotte Perriand photographed old villages in the

Jura Mountains (in the 1930s) [69] (p. 24). They both collaborated with Le Corbusier, who used these photos when designing his proto-brutalist houses. According to Le Corbusier, "no architect could match the judgement and skill of the humble peasant who builds his own house around his daily actions" [70] (p. 48). He emphasized that rural builders, who are also users of houses, can build them better than professional architects.

Brutalist architecture was supposed to be a parallel of life. Its creators noticed that in the past, the architecture of traditional villages and cities was correctly related to life. The austere, post-war times and the changing way of life resulted in the need to search for new, appropriate architectural and urban solutions. Brutalist architects not only reached for completely new ones but also began to process and reinterpret solutions that previously functioned well in social terms.

Many brutalists based their creative credo on the link between architecture and the realities of life. Le Corbusier used to say that life is always right and architecture is wrong [71] (p. 79). Kahn wrote that before everything an architect does becomes a building, it must be appropriate for human beings. "You don't know yet what a building is, as long as you don't believe in its identity with people's way of life" [72] (p. 303). A similar attitude was presented by Gottfried Böhm when he spoke about architecture in which forms and functions life finds its reflection and explanation [73] (p. 346). The Smithsons declared: "We see architecture as the direct result of a way of life" [67]. Inspired by the work of Henderson, they started researching people's connections with home, street, district, and city. The Smithsons prepared their grille for CIAM 9 using Henderson's photos from Bethnal Green. This ground-breaking presentation, known as the "Urban Reidentification" grid, concerned design with social associations [34].

The pursuit of a complete environment for human beings was expressed by the Smithsons in the competition project for the Golden Lane Housing Estate in London (1952). In this project, "street decks" appeared for the first time. They were not only access galleries to flats but also served as spaces for social contacts. So, they were a reinterpretation of streets in traditional housing estates. The Smithsons believed that an important aspect of these "streets in the sky" [52] (p. 109) was their width (12 feet), providing space for meetings and other activities. They emphasized the relationship between architecture and everyday life in their design drawings, filling them with photographs of residents. In the perspectives of the estate, the human presence almost overwhelmed the architecture [1] (p. 360).

The idea from the unrealized Golden Lane project was applied in the Park Hill Estate in Sheffield (J. Lewis Womersley, Jack Lynn, Ivor Smith, 1957–1961). In Park Hill, street decks connect all the buildings and pass through the entire estate (Figure 12). At bends and intersections of street decks, there are spaces analogous to traditional street corners with intimate squares. They were supposed to be places of frequent meetings of residents. Here, people entered staircases and elevators and dumped garbage into the chute. The architects claimed that, in terms of neighborly relations, the chute was "the modern equivalent of a village pump" [2] (p. 132). Alan Powers wrote: "The street decks at Park Hill emphasized the new focus on circulation spaces and routes as a means of recovering the sense of community within this otherwise forbidding mass of structure" [52] (p. 114).

Lasdun designed a new type of multi-family residential building—the cluster block. In the cluster block, residential towers were attached to the central reinforced concrete circulation and service core (Figure 13). The connection was provided by short bridges leading into galleries and flats. The cluster block idea was fully implemented by Lasdun at Keeling House in London. The main place of neighborly contacts was not the gallery, but the central core in which the entrance hall and drying rooms (every second floor) were located. The architect proposed such a solution after analyzing the functioning of the traditional Bethnal Green buildings and the habits of their residents, such as meetings and gossip while hanging up the laundry.

In order to shape collective spaces, brutalist architects used such solutions as street decks, galleries, bridges (connecting buildings or their parts), rues intérieures, courtyards, terraces, and drying rooms. Virtually all of these spaces are associated with the circulation

of people. The architects' intention was for people walking through these spaces to meet and establish relationships in a natural way. Therefore, circulation and movement became the essence of architecture (not only residential), as well as an element crystallizing the building's form and helping users to understand it.

Figure 12. J. Lewis Womersley, Jack Lynn, Ivor Smith, Park Hill Estate in Sheffield, 1957–1961 (photo: Sarah Briggs Ramsey).

Figure 13. Denys Lasdun, Keeling House in London, 1957–1958 (photo: author of the article).

These noble ideas did not always work properly. In large-scale buildings and housing estates, spaces intended for neighborly contacts sometimes became places of vandalism and violence. An example is the Harumi Apartment Building in Tokyo, where street decks were used by children during the day and by bullies at night. Japanese architecture critic Noboru Kawazoe expressed his opinion about Harumi: "To be a true building it must melt into the history of its time. A building does not really belong to the people unless it is capable of absorbing the shadier sides of life along with the more pleasant" [2] (p. 131).

4.5. Ordinariness

The connection of art and architecture with the everyday life of ordinary people led to the apotheosis of ordinariness. Dubuffet was fascinated by ordinary things. In the 1950s, he painted a series of works entitled "Landscape tables", which presented everyday objects: dishes, bottles, papers, etc. He also emphasized the artistic potential of prosaic materials: "I've found myself suggesting certain materials, not so much those with a 'noble' reputation like marble or exotic woods, but instead very ordinary ones with no value at all like coal, asphalt or even mud . . . in the name of what . . . does man bedeck himself

with necklaces of shells and not spiders webs, with foxes furs and not their guts, in the name of what I'd like to know? Mud, rubbish and dirt are man's companions all the life; shouldn't they be precious to him, and isn't one doing man a service to remind him of their beauty" [74] (pp. 263–264)? Other avant-garde artists also used such unattractive materials as sand, gypsum, slag, and asphalt. Henderson photographed people in an ordinary London working-class neighborhood in everyday, unposed situations. In his other works, he used ordinary found objects. He also claimed: "I feel happiest among discarded things, vituperative fragments, cast casually from life, with the fizz of vitality still about them" [64] (p. 265).

Many architects were sure that they would be able to bring out exceptional artistic values from ordinary things and materials. The Smithsons rejected these fashionable and simulated ones. "Thus 'as found' was a new seeing of the ordinary, an openness as to how prosaic 'things' could re-energize our inventive activity. A confronting recognition of what the post-war world actually was like. In a society that had nothing. You reached for what there was, previously unthought of things" [6] (p. 201). Already in the installation "Patio and Pavilion", they demonstrated the intensity of the direct and ordinary [7] (p. 13). The harsh living conditions in Great Britain were reflected in both art and architecture. Anthony Vidler wrote that brutalism "was born out of the post-war culture of 'austerity Britain' [...] with almost everything either rationed or simply unavailable" [75] (p. 106).

Young architects, whose basic assumption was objectivity, had to take this austerity as a starting point. Thus, they began to use readily available materials. In England, it was primarily brick. Its advantage was not only commonness but also the fact that it was cheap. Brutalist architects were aware that for their understanding of architecture to be widely accepted, the buildings they proposed could not be expensive. In a difficult economic situation, the idea of simple and unspectacular architecture, which for many seemed a weakness, could become a decisive asset. Peter Smithson even claimed that he personally did not like brick, but he appreciated its qualities because of the prevailing conditions. In Sugden House, he used low-quality bricks of various shades. Such a material would be considered poor by most, but the Smithsons gave it artistic value. Other prosaic materials were also used in brutalism: stone, wood, sheet metal, common plywood, and blockboard [49] (p. 96). However, the most popular was concrete, which, apart from its ordinariness, also had transcendent features.

Architectural and construction elements, as well as details, were also ordinary, sometimes even primitive. It can be said that the steel structure used by the Smithsons in Hunstanton School (1949–1954) was a primitivized version of Mies van der Rohe's structure from the Illinois Institute of Technology. The steel frames were welded in the simplest way. They lacked elaborate details such as Mies's famous corner pillar. The Smithsons wrote about their House in Soho that it was supposed to have a simple construction as in a small warehouse [12]. Maisons Jaoul in Neuilly-sur-Seine (1953–1955) designed by Le Corbusier is an extreme example of the apotheosis of ordinariness in brutalism (Figure 14). Even very monumental works were erected from concrete and brick using primitive techniques, such as buildings designed by Kahn in Bangladesh.

The forms of buildings in the first phase of brutalism were also quite simple. The architects used a small number of solids and elements, and their compositions were not complicated. The emphasis was on clarity and coherence between material, construction, and form. However, over the years, the forms have become more complex and even bombastic. In the later phase of brutalism, the tendency toward the apotheosis of ordinariness survived in the works of a handful of architects. Lina Bo Bardi based on this tendency: "I was looking for simple architecture [...] I made the most of my 5 years in the northeast of Brazil, a lesson of popular experience, not as folkloric romanticism but as an experiment in simplification. By means of a popular experiment, I arrived at what might be called Poor Architecture" [57] (pp. 153–154). Undoubtedly, Bo Bardi was also influenced by the works of other Brazilian brutalist architects tending to the ordinary. These include the buildings of Vilanova Artigas (Casa Martirani in São Paulo, 1969–1974) (Figure 15) and Paulo Mendes

da Rocha (Casa Millán in São Paulo, 1970). The forms of their buildings are simple concrete blocks with few windows. An equally radical example is the Florist Kiosk at the Malmö Cemetery (1969) designed by Sigurd Lewerentz [26] (p. 11).

Figure 14. Le Corbusier, Maisons Jaoul in Neuilly-sur-Seine, 1953–1955 (photo: author of the article).

Figure 15. Vilanova Artigas, Casa Martirani in São Paulo, 1969–1974 (photo: Nelson Kon).

4.6. Sincerity of Material, Structure, and Function

Sincerity was an attribute especially valued in avant-garde art trends. The artists expressed their emotions in an honest and direct way—thanks to their independence from the prevailing cultural norms and current artistic trends. They also directly exposed the nature and properties of the material they used. This was characteristic of Paolozzi's works [59]. In some cases, a sculpture seemed to be almost a study of the properties of its material [36] (p. 63). Artists and then brutalist architects rejected abstraction and emphasized the importance of materiality.

The value of sincerity and directness in art brut and art autre inspired brutalist architects to honestly display the structure of buildings [9], but not only that. The form of the building answered four general questions.

1. What materials was the building made of?
2. What is its construction?
3. How was it built?
4. How does it work?

(1) Brutalist architects exposed raw, as found materials in their buildings. In this way, they showed their natural color, internal structure, and other features. They rejected the aestheticization of the building's surfaces and any imitations. They did not use plaster or cladding. The Smithsons emphasized: "We were concerned with the seeing of materials for what they were: the woodness of wood, the sandiness of sand. With this came a distaste of the simulated" [6] (p. 201). Each material was supposed to show only what it really is. Cast

concrete, the most important material in brutalism, was a doubly honest solution in the minds of architects. Béton brut reflected both the nature of the building material and that of the formwork. It should be noted that some concrete buildings have a similar character to the sculptures of Paolozzi. They show the enormous textural possibilities of concrete. A relevant example is the Hayward Gallery.

(2) Architects exposed an overall constructional system of a building and its individual elements, such as columns, beams, and floor slabs. They were visible in the facades, as no cladding or curtain walls were used. Reinforced concrete elements were usually exposed also in brick walls. Even in the facades entirely made of concrete, the constructional elements were distinguished, for example with the help of various textures. There was also a tendency to enlarge construction elements and give them sculptural shapes (against the idea of ordinariness). Thick, angular poles were used by Marcel Breuer in the Becton Engineering and Applied Sciences Center in New Haven (1969–1970). In turn, the curved supports in the Australian Embassy in Paris (1975–1977) was an idea of Harry Seidler (Figure 16).

Figure 16. Harry Seidler, Australian Embassy in Paris, 1975–1977 (photo: author of the article).

(3) Striving for truth in architecture, brutalist architects reflected the methods and stages of erecting a building in its form and surfaces. In the case of cast concrete, traces of the building process were especially the lines (striations) left by the edges of the formwork and the imprint of its surface. The holes left by the formwork assembly elements—nails, screws, spacers—were also exposed. One of the first architects who decided to leave circular holes produced by spacers was Antonin Raymond. In the walls of the Gunma Ongaku Center erected in 1955 in Takasaki, these marks form an additional pattern and are a badge of authenticity [76]. This was also the practice of Kahn, for whom the direct presentation of a building process was the essence of architecture: "An architectural volume is characterized by the fact that it shows how it has been made" [77] (p. 423).

(4) The articulation of internal functions in the form of a building was undoubtedly a way of showing how the building works. The display of technical elements and installations played a similar role. Water, sewage, electricity, and other installations were visible inside. Elements of water drainage from the roof (gutters, gargoyles) and ventilation elements (chimneys, air intakes) were exposed outside. The Hunstanton School was pioneering in this regard. Banham wrote about the sincerity of this building: "Water and electricity do not come out of unexplained holes in the wall, but are delivered to the point of use by visible pipes and manifest conduits. One can see what Hunstanton is made of, and how it works, and there is not another thing to see except the play of spaces" [1] (p. 357). Paul Rudolph, who later in his work rather hid installations, in the Blue Cross and Blue Shield Building in Boston (1957–1960) created a composition of ventilation ducts on the facades (Figure 17). Rudolph actually designed a heating, ventilation, and air-conditioning system with ducts placed within exterior concrete piers [21] (pp. 49–54).

Figure 17. Paul Rudolph, Blue Cross and Blue Shield Building in Boston, 1957–1960 (photo: author of the article).

4.7. Textures—Roughness and Defects

Most brutalist architects preferred rough, uneven textures. Dubuffet's paintings and Paolozzi's sculptures drew the architects' attention to the qualities of such raw surfaces, bearing traces of the way they were made.

Dubuffet emphasized that the texture of a painting is a means by which the painter expresses himself. He preferred the expressive, dynamic, and spontaneous application of painting material. The layer of paint or other matter was thick and expressive. Dubuffet believed that the essential gesture of a painter is to smear, not to smooth. In this way, he wanted "to imprint the most immediate traces that he may have of his thoughts and rhythms and impulses coursing through his arteries and running along the length of his nerve endings" [78] (p. 35). Therefore, the rough texture was an expression of emotions and mind. Dubuffet's ideas helped brutalist architects to justify the thesis that the use of rough and raw materials in architecture is not a regression, but an expression of avant-garde taste.

Paolozzi's sculptures also had rough surfaces. Using bronze or concrete, he finished their aesthetic development at an earlier stage than other artists. For Paolozzi, it was raw material not "artist's material" [59]. Some of Paolozzi's sculptures were large and monumental. Observed from a distance, they seemed coarse, as if roughly hewn. However, up close, their rough surface revealed details, small objects that made it up [32] (p. 88).

The massiveness and heaviness of solids and monumental forms became the hallmarks of brutalist architecture in the following years. In contrast, brutalist buildings, such as the sculptures of Paolozzi, changed depending on the distance of the observer. Only after approaching the building, the observer was discovering the structure of their surfaces—for example, an imprint of formwork and components of concrete. Rough surfaces prevailed in brutalism because the textures were supposed to be sensual. The uneven and heterogeneous surfaces were picturesque, and they produced variable visual effects also depending on the lighting. Smooth textures were also used, but most often to juxtapose them with rough surfaces, following the brutalist principle of contrast.

Picturesque brick textures were designed by Le Corbusier and the Smithsons, and even Rudolph (Yale Married Student Housing in New Haven, 1960–1961), who was known for his concrete textures. Le Corbusier hired unskilled Algerian workers using crude and primitive building techniques. In this way, he wanted to achieve the effect of sloppy and carelessly made brick walls. James Stirling admitted that he was shocked but also excited when he saw the Jaoul Houses within half a mile of the Champs Elysèes built in contrast to sophisticated constructional habits with the use of "ladders, hammers and nails". [2] (p. 86). In developing countries, primitiveness was an immanent feature of brickwork, and that is why such aesthetics is visible in local brutalist buildings, e.g., in the Center for Environment and Planning Technology in Ahmedabad (Figure 18). It was the same with concrete buildings. Many architects also opted for craftsmanship rather than precise prefabrication. They followed Dubuffet, who emphasized: "The more the artist's hand is

apparent in the entire work, the more moving, the more human, the more eloquent it will be. Avoid all mechanical and impersonal means. The most meticulous typography and calligraphy are less alluring than a few hand-written, unpremeditated words scrawled by a devoted hand" [78] (p. 35).

Figure 18. Balkrishna Doshi, Center for Environment and Planning Technology in Ahmedabad, 1968–1972 (photo: Aurobindo Ogra).

Artisanal building methods, according to many architects, gave their works additional value. Unlike prefabricated buildings, they were original and unique. Each of their fragments was characterized by individualism and contained immanent features. The erection of a building from concrete placed on the site was an even more difficult and complex artisanal task than bricklaying. Max Bächer claimed: "Here is the very essence of 'hand-made' article. Here is task calling, if ever one did, for the fullest mental and manual skills of the dedicated craftsman" [79] (p. 64). In some brutalist buildings, defects of surfaces were not hidden, and even highlighted, as in Unite d'Habitation in Marseille (1947–1952) (Figure 19). Architects considered cracks, blisterings, and efflorescences to be an inherent feature of the material. In addition to Le Corbusier, this approach to concrete texture can also be found in buildings designed by Hans Litz and Fritz Schwartz. In the Sports and Recreation Center in Zürich (1961–1965), they used coarse wooden formwork with gaps between the boards and left all texture defects. John Andrews achieved a similar effect using metal sheet formwork in Scarborough College in Toronto (1963–1965).

Figure 19. Le Corbusier, Unite d'Habitation in Marseille, 1947–1952 (photo: Tomasz Basista).

As a result of exposing rough textures with defects, some brutalist buildings already on the day of completion looked as if they had been destroyed by time, as if they were almost ruins. It was a deliberate effect that was to add splendor to the building and bring it closer to the great works of the past that have survived for centuries. The building was

to become "a magnificent ruin" [2] (p. 16). These poetics came from the surface of the building, it was inherent in its texture.

The fascination with ruins was related to the war trauma noticeable in the works of avant-garde artists. The installation "Patio and Pavilion" should be mentioned again, as it presented the image of a makeshift building erected on rubble among scattered objects. Fragments of buildings destroyed during the war were also visible in other works by Paolozzi and Henderson. Especially for Henderson, it was important to capture the problem of time, place, and passing in the photographs. He was interested in specific signs of space, defects in buildings, "slicks and patches of tar on the roads, the cracks and slicks end erosive marks on pavement slabs, the ageing of wood and paintwork, the rich layering of billboards" [7] (p. 94). The Smithsons were interested not only in ancient ruins but also in the ruins of industrial facilities. This was due to both the search for the basics and the rediscovery of the genius of the place. They wrote: "Our enjoyment of ruined places, liberated spaces intended for life but emptied by time, their clean yet evocative stones have, over the years, suggested to us we are on the threshold of a period of lyrical appropriateness" [49] (p. 325).

4.8. Found Objects and the Idea of As Found

The use of found objects was the essence of the work of avant-garde artists and influenced brutalist architects not only in terms of the way materials were used.

Paolozzi found everyday objects to make his works, as shown by the series of sculptures made using the lost wax method. This method allowed reflecting the shapes of materials and objects used to make the mold in the finished sculpture casting. The coarse bronze objects had rough surfaces from which broken toys, piano mechanisms, wheels, gun-sights, cogs, electrical parts, clock parts, broken combs, and bent forks emerged. Paolozzi described his artistic process as "the metamorphosis of rubbish" [32] (p. 87). Henderson placed objects and pieces of rubbish found in the ruins after the bombings in his photograms. He picked them up in London's bombarded East End and took them back to his darkroom. There, he lay them on light-sensitive paper to make what he called Hendograms [36] (p. 68). He also created collages with photos of found objects. Charlotte Perriand used found objects (objets trouvés) in her photographs. She described her works, often created together with Fernand Léger, as art brut. She especially liked driftwood, shells, and debris, lifting these objects out of obscurity and giving them the status of works of art [80]. She used her artistic experience while working with Le Corbusier and Ernő Goldfinger. Brutalist architects treated building materials as found objects. They used raw materials without any surface treatment, which has already been analyzed above. It is worth noting that they really used found objects as well as artefacts found at the construction site. Gottfried Böhm in the Hotel Godesberg in Bad Godesberg on the Rhine (1961) incorporated the stone walls of the ruined castle into the new architectural structure [79] (p. 40). Altug and Behruz Cinici in the METU Faculty of Architecture Building in Ankara have inserted an original historical wooden door called "han kapisi" (Figure 20).

However, As Found in brutalist architecture should also be understood as a broad idea and the resulting design method. The idea of As Found contributed to noticing various aspects of the context, searching for specific features of a place, and taking into account the existing conditions in the project. The uniqueness of the design solutions of brutalist architects resulted precisely from the fact that they treated the existing situation as a found object with all its immanent features.

According to the idea of As Found, the value of the thing was contained in the thing itself. The brutalists did not modify the thing itself but tried to change its relations with other objects and with people. Anette Busse noted: "As Found meant taking something existing and reinterpreting in relation to reality" [81] (p. 93). The design method used, among others by the Smithsons involved "picking up, turning over and putting with; a careful consideration of ordering and an appreciation of the ordinary" [7] (p. 194). In fact, it was a creative process transferred directly from the artistic experience of Paolozzi or

Henderson. An example was the Upper Lawn Pavilion in Fonthill Abbey (1961). First, the Smithsons assessed the situation and the place, analyzing the remains (foundations, stone walls, chimney) of the old house. Then, they reinterpreted it in relation to new needs, deciding to use some parts of the old structure. As a result, they developed the new building with significant preservation of the original artefacts.

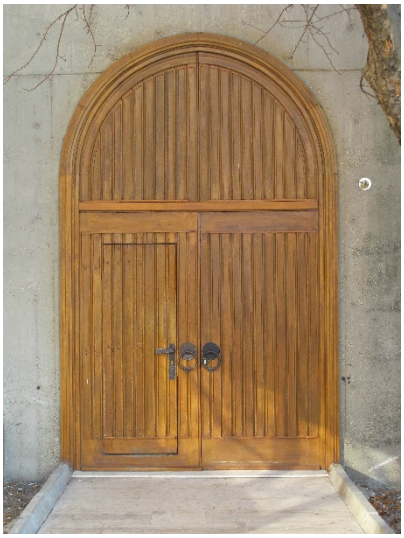

Figure 20. Altug and Behruz Cinici, METU Faculty of Architecture Building in Ankara, 1961–1963 (photo: Haluk Zelef).

Kallmann also followed the idea of As Found when creating his concept of "action architecture". He insisted on accepting the reality of established urban, social, and even political contexts. "If governments wanted to represent authority, then architects would oblige; if cities were threatening places, 'as found', perhaps buildings ought to be tough and defensive" [50] (p. 56). It is worth noting that many brutalist buildings, especially those from the 1960s (the period of the Cold War and social unrest), have defensive and heavy forms (Figure 21).

Figure 21. Gerhard Kallmann and Michael McKinnell, City Hall in Boston, 1963–1968 (photo: author of the article).

5. Conclusions

The greatest impact on brutalist architecture was exerted by such avant-garde trends as art autre, art brut, and musique concrète. Architects were most inspired by the works of Jackson Pollock, Jean Dubuffet, Pierre Schaeffer, Eduardo Paolozzi, and Nigel Henderson. This influence was most evident in the beginnings and the first phase of brutalism, that is, in the 1950s and early 1960s.

After the end of World War II, both avant-garde artists and architects searched for a new style that would correspond to the harsh reality and the changing way of life. They were convinced that the language of architecture and art should, first of all, be moving; it should evoke emotions. Young architects reached for the ideas of avant-garde art, as they did not find the right ones in the architecture of that time. In fact, the only architect of the older generation whose work inspired them was Le Corbusier.

The studies of brutalist architecture have shown that it was a very complex and heterogeneous style. There were various trends in it, changing over time, and many architects developed their own, individual manner. The regional differentiation was also characteristic of brutalism. Therefore, it should be emphasized that the ideas derived from avant-garde art did not apply to all architects and their works to the same extent. Moreover, some buildings and their features, especially those from the late stage of brutalism, seem to contradict these ideas. Nevertheless, the hypothesis that many brutalist architects drew from the post-war avant-garde artistic trends a number of assumptions and ideas is correct and has been confirmed. These ideas found their implementation in brutalist buildings. The most important ideas were:

- Rejection of previous principles and doctrines,
- Searching for the basics,
- As Found,
- Glorification of ordinariness,
- Reflecting the realities of life,
- Sincerity of material, structure, and technology,
- Articulation of internal functions in the form of a building,
- Roughness of textures.

These ideas contributed to the development of the following forms, solutions, and aesthetic effects in brutalist architecture:

- Simplification of forms and elements,
- Forms and solutions inspired by vernacular architecture,
- Vehement juxtapositions of solids and elements,
- Repetitive and disturbed rhythms,
- Highlighting circulation and communication elements,
- Exposing structural elements,
- Exposing installations and technical elements,
- Ordinary materials,
- Raw materials,
- Poetics of “magnificent ruins”.

Among the architects who were largely guided by the ideas derived from avant-garde art were Le Corbusier, Alison and Peter Smithson, Denys Lasdun, James Stirling, Vittoriano Vigano, Louis I. Kahn, Paul Rudolph, Gerhard Kallmann, John Johansen, Joseph Lluís Sert, Kenzo Tange, Altug and Behruz Cinici, Vilanova Artigas, and Balkrishna Doshi.

The research showed that the idea of sincerity had the greatest impact on brutalist architecture. It contributed to the development of most of the architectural solutions and forms. Both at the beginning and the end of the style, its importance was great, especially in terms of the sincerity of the material. The remaining ideas were gradually devalued, which was one of the reasons for the fall of brutalism.

Funding: This research was carried out as part of work WZ/WA-IA/4/2020 at the Białystok University of Technology and financed from a research subsidy provided by the Ministry of Eductaion and Science of Poland.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Acknowledgments: The author thanks the fieldworkers for their important role in data collection. The author thanks the fieldworkers for their important role in data collection.

Conflicts of Interest: The author declares no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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